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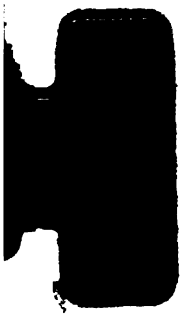

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PRESIDENT 1897-98

Transactions

of the

Colorado State Medical Society

Twenty-eighth and Twenty-ninth
Annual Conventions

By-Laws and List of Members

Denver, June, 1899
Published for the Society

Press of
The Smith-Brooks Printing Company
Denver, Colorado

OFFICERS.

1898-1899.

PRESIDENT,

W. A. CAMPBELL, M. D., Colorado Springs.

FIRST VICE PRESIDENT,

J. M. FOSTER, M. D., Denver.

SECOND VICE PRESIDENT,

SOL. G. KAHN, M. D., LEADVILLE.

THIRD VICE PRESIDENT,

J. F. ELLIOTT, M. D., Idaho Springs.

CORRESPONDING SECRETARY,

H. B. WHITNEY, M. D., Denver.

RECORDING SECRETARY.

MINNIE C. T. LOVE, M. D., DENVER.

ASSISTANT RECORDING SECRETARY,

J. C. CHIPMAN, M. D., Sterling.

TREASURER,

W. J. ROTHWELL, M. D., Denver.

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HUBERT WORK, M. D	Pueblo
S. E. SOLLY, M. D	Colorado Springs
J. T. ESKRIDGE, M. D	Denver

COMMITTEE OF ADMISSIONS.

T. A. HUGHES, M. D	Denver
A. J. ROBINSON, M. D	Aspen
S. D. HOPKINS, M. D	Denver
LEE KAHN, M. D	Leadville

STANDING COMMITTEES.

(Appointed by the President.)

1898-1899.

EXECUTIVE—C. A. Powers, Chairman; H. T. Pershing, S. G. Bonney, Robert Levy, Edward Jackson, E. P. Hershey, G. M. Black.

PUBLICATION—H. B. Whitney, Chairman; Minnie C. T. Love, C. K. Fleming, T. J. Gallaher, H. W. McLauthlin.

FINANCE—James A. Hart, Chairman; Leonard Freeman, P. F. Gildea, A. J. Robinson, S. D. Hopkins, Carroll E. Edson, E. C. Rivers.

MEDICAL ETHICS—J. N. Hall, Chairman; E. Stuver, John Boice, P. V. Carlin, H. G. Wetherill, G. B. Packard, Hubert Work.

SANITATION AND PREVENTIVE MEDICINE—W. P. Munn, Chairman; Henry Sewall, C. D. Spivak, Sol. Kahn, S. D. Van Meter, E. R. Axtell, R. K. Hutchings.

MEDICAL SOCIETIES—J. Tracy Melvin, Chairman; F. Finney, Jessie Hawes, F. H. McNaught, G. E. Tyler, J. W. Higgins, L. E. Lemen.

NECROLOGY—I. B. Perkins, Chairman; Clayton Parkhill, G. W. Miel, M. Kleiner, Laura Liebhardt, S. A. Fisk.

BY-LAWS—B. P. Anderson, Chairman; O. J. Pfeiffer, J. M. Foster, W. B. Fenn, M. Beshoar, J. T. Eskridge, J. R. Robinson.

LEGISLATIVE—W. A. Jayne, Chairman; S. E. Solly, J. W. Graham, A. Stedman, W. W. Grant, A. K. Worthington, E. J. A. Rogers.

DELEGATES TO THE AMERICAN MEDICAL ASSOCIATION.

DELEGATES.		ALTERNATES.	
J. W. Graham,	R. W. Corwin,	C. F. Gardiner,	W. W. Grant,
L. E. Lemen,	W. B. Craig,	Jessie Hawes,	J. J. Powers,
H B. Whitney,	J. T. Eskridge,	James A. Hart,	J. R. Robinson,
W. S. Bagot,	Frank Finney,	Lee Kahn,	Henry Sewall,
E. R. Axtell,	S. A. Fisk,	M. H. Mack,	S. E. Solly,
B. A. Arbogast,	J. N. Hall,	J. Tracy Melvin,	S. G. Bonney,
J. A. Black,	W. A. Jayne,	W. P. Munn,	E. Stuver,
E. T. Boyd,	Sol Kahn,	R. L. McCreery,	Beverly Tucker,
H. R. Bull.	Robert Levy,	Clayton Parkhill,	I. B. Perkins,
F. N. Carrier,	G. B. Packard.	H. T. Pershing,	F. E. Waxham.

Minutes of the Twenty-eighth Annual Convention of the Colorado State Medical Society, Held in Denver, June 6th, 1898

The meeting was called to order at 9:30 a. m., in the ordinary of the Windsor hotel, by the president, Dr. L. E. Lemen.

Invocation by Rev. Dr. Ecob.

The president then spoke as follows: Ladies and gentlemen, the association is now open for the deliberation of whatever business may be brought before it. We understand, probably all of us, that we are a little premature in our meeting, the regular date being after the session of the meeting of the American Medical Association. This meeting is called to transact what business you may desire and merge ourselves into a committee of the whole to entertain the American Medical Association. The next in the order of business will be the reading of the minutes of the last meeting.

Dr. Whitney moved that the minutes be omitted and adopted as contained in the Transactions. Motion carried.

Dr. L. Freeman then presented the following report of the executive committee:

The report of the executive committee is very short. There has been very little to do except arrange affairs, but there is one recommendation which the committee wishes very especially to urge: that the officers elected at the last meeting retain their positions during the meeting of the American Medical Association, and, owing to the fact that the various arrangements have been carried out with this end in view, the executive committee unanimously recommends that the officers and committees elected to-

day be not qualified until after the meeting of the American Medical Association.

President—I would like to put this suggestion in the form of a motion.

Motion seconded and carried.

The corresponding secretary, Dr. H. B. Whitney, then reported as follows:

During the past year the following names have been dropped from the membership roll of the society:

By Death—Dr. Hugo Mager, Dr. H. C. Crouch.

By Resignation—Dr. W. T. Maxwell, Dr. L. M. Ellis, Dr. Josephine Milligan, Dr. A. J. Osterman.

By Removal from the State—Dr. H. G. Rose, Dr. N. McPhatter.

For Non-Payment of Dues—Dr. Mary E. Bates, Dr. A. W. Coleman, Dr. John Davidson, Dr. E. Hobhouse, Dr. B. J. Perry, Dr. O. H. Simmons.

This leaves the present total active membership of the society at 311.

The collections during the year from old members of the society have amounted to $1,125, from new members, $190, making a total of $1,415.

No communications have been received during the year which demand action by the society.

On motion Dr. Whitney's report was accepted.

Dr. W. F. McClelland, treasurer, read the following report:

Mr. President and Members of the State Medical Society: I herewith hand you the treasurer's report to June 6, 1898:

Cash balance on hand.....	$ 313 71	
Receipts	1,859 00	
Total	$2,172 71	
Disbursements		$1,081 95
Cash on hand.....		1,090 76
		$2,172 71

Also $130 handed me this morning.

Report accepted.

Dr. McClelland then handed in his resignation as treasurer of the society.

Dr. Wilson—I desire to remark that Dr. McClelland has been treasurer for many years. I desire to pay a tribute to his honesty, intelligence and persistent work in the office.

Dr. Graham—If this request is granted—not that we feel disposed to grant it—I move an expression of the thanks of the association to Dr. McClelland.

President—Dr. Wilson rather anticipated what I was going to say myself. I believe I have been a member of this association for twenty-five years, and I would feel somewhat lost at our annual meetings if the form of Dr. McClelland did not rise before us and make his annual report. I regret that the doctor has taken this stand and requests that his name be left off; however, it is something the members of the association must consider. I wish to offer my tribute to the faithful service of Dr. McClelland. In my younger days, when I was a little neglectful, or perhaps impecunious, the doctor stirred me up until he got the $5, and his acuteness and acumen in that line have not abated. He has been the most faithful officer the association has ever had. If you are ready without any further steps, all in favor of the motion please rise. The vote is unanimous.

Dr. Wright—I suggest that we send a letter presenting the thanks of the association.

President—We will also take a rising vote on that question. All in favor signify by rising. Carried.

In response to a call for the report of the publication committee, Dr. Whitney, chairman, spoke as follows:

Mr. President, I have not written out any report. We had printed 400 volumes of transactions, at a cost of a little over $400; 325 copies were distributed to the members of the society and the rest to the officers of societies throughout the country. I believe that the transactions of this year were on the whole as good as of any year in the past. Report accepted.

Dr. Hall then moved that in order to economize time an appointment of a committee of nominations be made by the chair, to consist of five—no two from the same county—to report at once.

Dr. F. E. Waxham presented the report of the committee on medical ethics.

The president then announced the following committee on nominations:

Drs. W. W. Bulette, C. H. Call, Lee Kahn, E. Stuver, and J. N. Hall.

Dr. John Boice then reported as follows for the finance committee:

The duties are purely clerical and the committee has not, as yet, had an opportunity to do the clerical work—simply looked over the report of the treasurer. I notice in looking over the transactions of the year past there is no note of it, so the committee will, I presume, be able to do its work at any time without interfering with the work of the society.

Dr. Levy then moved that the society proceed to the election of new members.

Dr. Rogers—Mr. Chairman, while they are preparing the list, I would move that the transactions of this year be incorporated with the transactions of next year, so as to save expense more than anything else.

Both motions carried.

Dr. Hughes, chairman of the committee on admissions, then reported favorably upon the following named gentlemen:

J. Q. Allen of Montrose, Colo.
William J. Baird of Boulder, Colo.
A. L. Bennett of Libreville, West Africa.
J. A. Baker of Florence, Colo.
J. F. Coleman of Montrose, Colo.
L. G. Clark of Glenwood Springs, Colo.
W. B. Carver of Denver, Colo.
W. S. Chapman of Rouse, Colo.
J. F. Condon of Breckenridge, Colo.
W. Dow of La Junta, Colo.
F. M. Friend of Lamar, Colo.
J. Grass of Trinidad, Colo.
F. A. Greedy of Denver, Colo.
J. A. Gale of Denver, Colo.
C. A. Graham of Denver, Colo.

L. B. Hamly of Salida, Colo.
W. E. Holmes of Gunnison, Colo.
Theo. Hotopp of New Castle, Colo.
J. G. Hasty of Lamar, Colo.
D. S. Hoffman of Lake City, Colo.
L. F. Ingersoll of Grand Junction, Colo.
F. A. Jackson of Salida, Colo.
M. Jay of Gunnison, Colo.
F. E. James of Estes Park, Colo.
H. R. Johnson of Denver, Colo.
W. G. Lockard of New Castle, Colo.
R. D. Liggitt of Mosca, Colo.
R. S. Littrell of Rye, Colo.
Thomas Mafan of Salida, Colo.
W. McKelvy of Breckenridge, Colo.
R. K. Macalester of Glenwood Springs, Colo.
S. MacAlister of Rocky Ford, Colo.
N. Mackintosh of Gunnison, Colo.
W. D. Otis of Fort Morgan, Colo.
W. A. Packard of Monte Vista, Colo.
F. R. Porter of New Windsor, Colo.
F. E. Prewitt of Silverton, Colo.
F. E. Rogers of Littleton, Colo.
G. F. Roehrig of Denver, Colo.
M. A. Robison of Victor, Colo.
A. L. Robinson of Glenwood Springs, Colo.
F. M. Smith of Holyoke, Colo.
C. O. Sumner of Fairplay, Colo.
W. W. Smith of Erie, Colo.
W. C. Stephenson of Florence, Colo.
J. Sol Smith of Denver, Colo.
G. H. Thrailkill of Central, Colo.
E. B. Trovillion of Gold Hill, Colo.
C. W. Williams of Manzanola, Colo.

President—I would state for the information of the society that this will be the only session we have, and I think it would be a good plan for the society to authorize our committee on admissions to investigate and recommend any applicants for

membership who may put in an appearance after the meeting of this session, their acts being ratified at the meeting at Colorado Springs on the 11th.

Dr. Rogers—I move that the committee on admissions be authorized to receive the fee and enroll such members as they may see fit, and the formality of election be gone through next year. If there is any doubt on any one, the committee to be instructed.

President—They can be recommended and balloted upon at Colorado Springs—extend the privileges of the association. On any other point they will have to be indorsed by said committee in order to become members of the American Medical Association, I think.

Dr. Graham—I move that the question of these admissions be left to the executive committee.

This motion was carried. The president then announced that all the applicants for membership had been elected.

Dr. Rogers—Mr. President, I am requested to move that all the funds now in the treasury, and to come in at this meeting, after the payment of the accrued debts and expenses, be appropriated toward the expenses of the Loop trip and entertaining the American Medical Association on Friday next.

President—If there is any surplus, of course, it can be returned to the society. The proposition is that all the funds in the treasury are to be appropriated for the American Medical Association to pay for the trip given by the State Medical Society on Friday.

Dr. Levy—I would like to know whether it is the committee's opinion that it will be necessary to use all the funds. I think the motion made by Dr. Rogers is worded poorly. Dr. Rogers says, "that we use all the funds of the society." I would word it in this way: "That the funds necessary be drawn from the funds of the society." The society is in debt several hundred dollars, and we may be called upon to pay it. I should think it would be advisable to say: "All that portion of the funds necessary to pay for this trip."

Dr. Rogers—We would place the funds of the society at the disposal of the committee for meeting the expenses of the trip on the 11th—all the present funds.

President—If the chair understands the motion and the second, it is that all funds may be expended, if necessary, in the entertainment of the association on this Loop trip—nothing beyond present or unexpended amount in the treasury, after the executive committee's expenses are paid. Perhaps, in so many words, that's about it. Is that the idea?

Dr. Hall—We might as well provide for some stated expenses that we have—for instance, postage, etc.

President—I believe it would be better to write that out as a resolution, so that there may be no misunderstanding. While that resolution is being prepared we will proceed to the election of president.

The nominating committee then reported the following names:

For president—
Dr. W. A. Campbell, Colorado Springs.
Dr. H. R. Bull, Grand Junction.
Dr. C. D. Nelson, Greeley.

For vice president—
Dr. J. M. Foster, Denver.

For second vice president—
Dr. Sol G. Kahn, Leadville.

For third vice president—
Dr. J. F. Elliott, Idaho Springs.

For corresponding secretary—
Dr. H. B. Whitney, Denver.
Dr. R. Levy, Denver.
Dr. S. D. Hopkins, Denver.

For recording secretary—
Dr. Minnie C. T. Love, Denver.

President—We will now vote upon the following resolution, with the permission of the gentleman who offered the motion:

"That all funds necessary, now in the treasury and to come in at this meeting, after the payment of the accrued debts and expenses, be appropriated toward the expenses of the Loop trip and entertaining the American Medical Association on Friday next."

Dr. Levy—Mr. President, that resolution is acceptable and I withdraw my objection to the preceding motion.

Motion carried unanimously.

Dr. M. Kleiner—In connection with this resolution I wish to extend to Dr. Lee Kahn, of the executive committee, the thanks of this society and executive committee for what he has done. It was necessary to take in as many members as possible, and Dr. Lee Kahn took it upon himself to collect funds for the society in the different mountain districts, and I think it is only due to him that this work of his be publicly announced.

President—If there is no objection we will extend a vote of thanks to Dr. Kahn.

Rising vote and carried.

President—The next in order of business under the motion would be the election of officers.

Dr. Miel—Mr. President, I desire to add another name to the list of candidates for president, Dr. Frank Finney, of La Junta.

Motion carried.

President—It will be recollected by the members of the society that the presidency is due to a member from Colorado Springs. In order to make this meeting of the American Medical Association a success, the members allowed the Denver men to put in Dr. Lemen, and the Denver men as a body pledged themselves to elect that man to office this year. I hope there will be no question about this, and hope we will elect Dr. Campbell, of Colorado Springs.

Dr. Miel—Mr. President, under the circumstances I will withdraw the nomination of Dr. Finney.

The society then proceeded to ballot for president. Forty-two votes were cast for Dr. Campbell, and two scattering. Dr. Campbell was declared elected as president for the ensuing year.

It was then moved that the secretary cast the vote for Dr. J. M. Foster as first vice president. The motion carried, and Dr. Foster was elected first vice president.

The same motion was made and carried regarding second vice president. Dr. Sol G. Kahn, of Leadville, was elected.

Dr. J. F. Elliott, of Idaho Springs, was elected third vice president in the same way.

In the election of corresponding secretary, Drs. Levy and Hopkins both withdrew their names, and on motion Dr. H. B. Whitney was elected by vote of the secretary.

For recording secretary, Dr. Minnie C. T. Love, of Denver, was elected on motion that the president cast the vote of the society for Dr. Love.

Dr. J. C. Chipman, of Sterling, was elected assistant recording secretary.

For treasurer, Dr. Wm. J. Rothwell, of Denver, Dr. S. A. Fisk, of Denver, and Dr. J. T. Eskridge, of Denver, were nominated. The names of Dr. Eskridge and Dr. Fisk were both withdrawn, and on motion the secretary cast the vote of the society for Dr. Rothwell.

The nominating committee recommended that the board of trustees remain as it stands. On motion this recommendation was accepted and the old board reëlected.

The following nominations were presented for the committee on admissions: Dr. T. A. Hughes, Denver; Dr. A. J. Robinson, Aspen; Dr. S. D. Hopkins, Denver; Dr. Lee Kahn, Leadville.

On motion the secretary cast the unanimous vote of the society for the committee on admissions as recommended by the nominating committee.

On motion the meeting then adjourned at 11 o'clock a. m.

W. A. CAMPBELL, M. D.

PRESIDENT 1898-99

OFFICERS.

1899-1900.

PRESIDENT,

J. N. HALL, M. D., Denver.

FIRST VICE PRESIDENT,

P. J. McHUGH, M. D., Fort Collins.

SECOND VICE PRESIDENT,

L. O. MAFFETT, M. D., Colorado Springs.

THIRD VICE PRESIDENT,

M. HARRISON, M. D., Boulder.

CORRESPONDING SECRETARY,

H. B. WHITNEY, M. D., Denver.

RECORDING SECRETARY,

MINNIE C. T. LOVE, M. D., Denver.

ASSISTANT RECORDING SECRETARY,

W. T. LITTLE, M. D., Canon City.

TREASURER,

WM. J. ROTHWELL, M. D., Denver.

BOARD OF TRUSTEES.

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W. E. WILSON, M. D.....Denver
H. WORK, M. D.....Pueblo
S. E. SOLLY, M. D.....Colorado Springs
J. T. ESKRIDGE, M. D.....Denver

COMMITTEE ON ADMISSIONS.

C. K. FLEMING, M. D.....Denver
W. W. GRANT, M. D.....Denver
J. TRACY MELVIN, M. D.....Saguache
M. McNEELAN, M. D.....Basalt

STANDING COMMITTEES.

(Appointed by the President.)

1899-1900.

EXECUTIVE—S. D. Hopkins, W. W. Grant, W. P. Munn, E. P. Hershey, L. Freeman, C. K. Fleming, I. B. Perkins.

PUBLICATION—H. B. Whitney, E. R. Axtell, S. G. Bonney, Minnie C. T. Love, Edward Delehanty, H. W. Rover, Laura L. Liebhardt.

FINANCE—W. H. Davis, F. N. Cochems, W. E. Shotwell, J. W. Purcell, W. A. Kickland, Alfred Mann, E. Stuver.

MEDICAL ETHICS—Sol G. Kahn, J. M. Blaine, Geo. B. Packard, R. W. Corwin, F. H. McNaught, C. B. VanZant, Thos. Maghee.

SANITATION AND PREVENTIVE MEDICINE—H. C. Call, John F. Elliott, T. J. Carlin, H. W. McLauthlin, G. E. Tyler, W. H. Bergtold, C. F. Gardiner.

MEDICAL SOCIETIES—W. N. Beggs, E. J. A. Rogers, C. G. Hickey, J. W. Hawk, A. J. Robinson, J. W. Higgins, R. K. Hutchings.

NECROLOGY—A. Stedman, T. A. Hughes, S. E. Solly, H. Sewall, W. C. Bane, B. L. Jefferson, J. C. Chipman.

BY-LAWS—Frank Finney, W. A. Jayne, H. R. Bull, H. T. Pershing, O. J. Pfeiffer, P. F. Gildea.

LEGISLATIVE—J. R. Robinson, G. M. Black, J. Nicoll Vroom, J. T. Eskridge, J. M. Foster, J. P. Kelly, J. L. Clark.

REVISION OF PHARMACOPOEIA—J. Tracy Melvin, W. E. Wilson, E. C. Hill.

PLACE OF MEETING—H. G. Wetherill, H. Work, W. A. Campbell.

PATHOLOGICAL LABORATORY—C. A. Powers, W. B. Fenn, L. Freeman.

ON PRESS CENSORSHIP—C. D. Spivak, E. Denison, E. R. Axtell, Sol G. Kahn, C. D. Nelson.

* DELEGATES TO THE AMERICAN MEDICAL ASSOCIATION.

DELEGATES.		ALTERNATES.	
J. Hawes,	R. F. Graham,	M. Kleiner,	S. D. Van Moter,
W. W. Grant,	J. A. Hart,	P. D. Rothwell,	A. K. Worthington,
E. C. Rivers,	A. M. Holmes,	Hugh Taylor,	L. MacLean,
J. W. Graham,	A. T. King,	G. H. Stover,	E. A. Lee,
S. E. Solly,	R. F. LeMond,	M. H. Dean,	P. V. Carlin,
Clayton Parkhill.	L. E. Lemen,	D. H. Coover,	John Boice,
T. H. Hawkins,	R. Levy,	C. P. Conroy,	G. W. Miel,
S. G. Bonney,	W. P. Munn,	J. N. Thomas,	S. T. McDermith,
John Elsner,	John Law,	J. G. Keith,	C. F. Shollenberger.
Edw. Jackson,	C. E. Edson.	A. J. McDonald,	

*Delegates unable to attend are expected to notify the Secretary one month before the Association convenes. The Secretary will then notify the corresponding alternate.
The President will appoint other alternates in place of those unable to attend.

Minutes of the Twenty-ninth Annual Convention of the Colorado State Medical Society, Held in Denver, June 20, 21 and 22, 1899

TUESDAY, JUNE 20.

MORNING SESSION.

The society was called to order at 9 a. m., in the ordinary of the Brown Palace hotel, President W. A. Campbell, of Colorado Springs, in the chair.

The minutes of the last annual meeting were read and approved, and ordered printed in the proceedings.

Dr. C. A. Powers then reported as follows for the executive committee:

I have very little to say, Mr. President, for the program lies before you. Owing to the length of the program, the executive committee begs to recommend as follows, and I beg to put this in the form of a motion: I move you, sir, that general papers be strictly limited in length by the president to fifteen minutes; that all papers in the symposiums and set discussions be limited to ten minutes, and all discussions be limited to five minutes, and that the society do not appeal from the decision of the chair in this matter. It is absolutely necessary that it be so limited in order to get through with the work.

Motion carried.

Dr. Powers—The executive committee further recommends, Mr. President, that the discussions and special addresses which are fixed on our program for certain hours, as that at 10 this morning, and the address of Dr. Babcock at 11:30 to-morrow

morning, take place at the hours assigned; and whatever may be left undone of the work preceding this be allowed to stand undone—in case a .paper is being read, the reader should certainly be permitted to finish that paper and ordinary discussion on that should take place, which might make a difference of a few minutes. I move you, sir, that these various set topics which are arranged for certain hours on our program take place without exception at those hours, or as nearly as the president can possibly arrange.

Carried.

Dr. Powers made the announcement that at 8 o'clock the out-of-town members of the society, with their families, were to be the guests of the local society at Manhattan Beach, and that on Thursday evening the annual dinner would take place, when the out-of-town members would be the guests of the profession in Denver.

Dr. H. B. Whitney, recording secretary, submitted the following report:

The present total membership of the society is 333. During the year the following losses have been sustained:

By Death—Drs. J. W. Dawson, of Cañon City; J. C. Herrick, Denver; Lee Kahn, Leadville.

By Resignation—Drs. R. T. Gilmore, J. T. Muir, Annie W. Williams.

For Non-Payment of Dues—Drs. A. M. Bucknum, H. H. Bucknum, Mary H. Barker Bates, George Cleary, A. G. Case, William Edmundson, E. H. Fish, F. D. Green, Charles Hunter, A. S. Lobingier, F. H. Marey, J. L. Prentiss, C. O. Rice, T. A. Stoddard, L. M. Walker, E. L. Woods, B. F. Wooding.

During the year the sum of $415 has been collected by the secretary and handed to the treasurer.

On July 7, 1898, since there was no annual publication, a printed list of the officers and various committees was sent to each member of the society.

The various pamphlets and transactions of medical societies received during the year will be sent as usual to the Colorado Medical Library Association.

On motion report was approved.

Dr. H. B. Whitney, chairman of the publication committee, submitted the following report:

On account of the meeting in Denver of the American Medical Association in June, 1898, the scientific program of the State Medical Society was, as you know, omitted. It was therefore voted at the business meeting of the society that no transactions be published in 1898, and that the minutes of the business meeting be incorporated in the transactions of 1899. Hence the publication committee has no further report to make.

On motion the report was adopted.

There being none of the chairmen of the other committees present, the society proceeded with the scientific program. The first paper presented was by Dr. R. F. LeMond, of Denver, on "The Value of Electricity in Eye Work," which was followed by a paper on "Some Cases of Facial Spasm and the Associated Refractions," by Dr. E. W. Stevens of Denver. These papers were discussed by Drs. Edward Jackson and G. M. Black, and discussion closed by Drs. E. W. Stevens and R. F. LeMond.

The next papers read were "Contusions of the Eye," by Dr. W. C. Bane, of Denver; "Foreign Bodies Lodged Within the Eye-Ball," by Dr. Edward Jackson, Denver, and "Foreign Bodies on the Cornea," by Dr. G. M. Black, Denver. These papers were discussed by Drs. W. C. Bane and G. M. Black.

Dr. William J. Rothwell, of Denver, treasurer of the society, made the following report:

I did not take office immediately after the last meeting of the society. Dr. McClelland closed up all the business connected with the last meeting of the society, paying bills, etc., which accounts for the small amount on hand.

Received from Dr. McClelland, former treasurer	$ 30.61
Received from Dr. Whitney during the year.	330.00
Total receipts	$360.61
Paid out, as shown by vouchers	136.03
Balance on hand	$224.58

Upon motion, the president appointed Drs. S. E. Solley, W. P. Munn and G. M. Black as an auditing committee to examine and report upon the accounts of the treasurer.

The next paper read was entitled "The Use of Salicin in the Treatment of Acute Rheumatism," by Dr. J. W. Cline of Georgetown, which was discussed by Drs. E. Stuver, S. E. Solly, J. Tracy Melvin, H. B. Whitney, and discussion closed by Dr. Cline.

The next paper read was by Dr. J. M. Foster of Denver on "The Relation of Diseases of the Ear to Those of the Nose and Throat." This paper was discussed by Drs. G. M. Black, W. P. Munn and S. E. Solly.

The society here took a recess until 2 o'clock.

AFTERNOON SESSION.

The society was called to order by the president at 2 o'clock.

Dr. Powers moved that the matter of the nominating committee be taken up by the society at 11:30 to-morrow morning.

Motion carried.

The first matter on the program was the symposium on pneumonia. Dr. W. N. Beggs, who had the first paper, on "Etiology," not being present, the first paper read was by Dr. J. N. Hall, of Denver, on "Varieties," which was discussed by Dr. C. B. Van Zant.

The next subject, "Modifications in Tubercular Subjects," was discussed orally by Dr. S. E. Solly, of Colorado Springs.

"Chronic Pneumonia," by Dr. E. R. Axtell, of Denver, was the next paper read, which was discussed by Dr. Wm. J. Rothwell.

The following papers were next read:

"As a Complication in Acute Diseases," by Dr. H. B. Whitney, of Denver.

"Etiology," by Dr. W. N. Beggs, Denver.

"Abscess and Other Septic Conditions Following," by Dr. Leonard Freeman, Denver.

"Treatment," by Dr. E. P. Hershey, Denver. This paper was discussed by Dr. W. T. Little, of Cañon City.

The last paper of the symposium, "The Hydriatic Treatment," was by Dr. R. K. Macalester, Glenwood Springs.

The papers in the symposium were then discussed by Dr. Charles Denison, Dr. E. Stuver, Dr. S. E. Solly, Dr. J. Tracy Melvin, Dr. H. B. Whitney and Dr. E. C. Hill.

Dr. C. D. Spivak, of Denver, followed with a paper entitled "Diet as a Method of Diagnosis."

The secretary read the following letter:

"Athens, Pa., May 31, 1899.

"Dear Doctor: At the annual session of the Medical Society of the State of Pennsylvania, held in Johnstown, May 16-18, 1899, you were appointed a delegate to the meeting of the Colorado State Medical Society, Denver, June 20-22, 1899.

"C. L. STEVENS, Secretary.

"To Dr. John B. Roberts, Philadelphia."

Dr. Denison—I move that the courtesies of the society be extended to Dr. Roberts and also to Dr. Babcock, of Chicago, and that they be invited to take part in the discussions and proceedings of the society.

Motion carried unanimously.

The next paper read was by Dr. E. R. Axtell, of Denver, whose subject was "Diuretics in Renal Dropsy, Their Indication and Use."

The next paper was read by Dr. Wm. J. Rothwell, of Denver, on "The Intestinal Neuroses."

Dr. G. H. Stover, of Denver, requested that his paper on "Leukæmia, With Especial Reference to the Blood Appearances," be read by title.

The next paper read was by Dr. E. Stuver, of Fort Collins, entitled "The Importance of a Knowledge of the Phylogenetic Development of the Child in the Prevention of Children's Diseases."

Dr. Wm. P. Munn—There is absent from us this day a gentleman who has been with us for over twenty years, and he is only absent on account of severe illness. I feel that he would appreciate from the depths of his heart a telegram of greeting from this society. Therefore, I move you that the president, in

the name of the society, be instructed to send a telegram of greeting to Dr. Samuel A. Fisk.

Dr. Pershing—I am very glad indeed of an opportunity to second that motion, not only because Dr. Fisk is one of my good personal friends, but because he is a man who has always shown a good deal of public spirit in our medical society. He was president of this society more than ten years ago, and he has always been very willing to bear his share of the work that falls upon men who take an interest in the medical affairs of the society and of the state. I very heartily second the motion of Dr. Munn.

The President—It will give me pleasure to send this telegram to Dr. Fisk, and I am glad to hear the words of commendation on the work of Dr. Fisk in the society in the days that are passed.

Which motion was carried unanimously, and the president later reported that he had sent the following telegram:

"Dr. Samuel A. Fisk, Bromfield Hotel, Bromfield, Mass.

"The State Society sends greetings, and hopes for your speedy return."

WEDNESDAY, JUNE 21.

MORNING SESSION.

Dr. W. P. Munn, chairman of the committee on sanitation and preventive medicine, presented the following report, which on motion was adopted:

To the Members of the Colorado State Medical Society:

Your committee feels that the year that has passed has not been devoid of events that should be of interest to all who are concerned for the public welfare as affected by sanitary conditions.

The war with Spain emphasized, as no other event of this generation has done or could do, the utter neglect of sanitary knowledge and advancement that has characterized the United States as a nation. It is sad, but true, that the same spirit that has dominated Americans in their civic affairs and has justly subjected them to the criticism recently made through one of our own local papers by an Austrian traveler, that "American cities are not clean when compared with those of other civilized countries," should also have governed us in sanitary matters pertaining to the short, decisive and otherwise brilliant war in which our military forces were engaged.

It was perfectly apparent to those familiar with the condition of camps, from the very outset, that what our army most needed from a medical point of view, was not treatment but prevention. The volunteer regiments were, however, so officered that but few regiments contained officers familiar with the duties that should have been performed in order to keep their men in a healthful condition as a result of sanitary measures wisely thought out and faithfully enforced. The disgraceful prevalence of typhoid fever and other filth diseases in most of the regiments, especially at Chattanooga, was the legitimate re-

sult of this ignorance and neglect. Not one atom of the blame for these regrettable occurrences can be laid to the door of the medical department of the army nor to the administration at Washington. The fault lies in the system that permits governors of states to name the officers for regiments that are to be mustered into the United States service, and back of that the responsibility lies upon congress and the miserable political spirit that has always, and probably always will so hamper the organization of the medical service, preventing it from building up in every state of the Union a well-instructed and well-organized skeleton organization under central authority, which shall in time of war at once assume responsibility for the welfare of the men composing the army.

Colorado has perhaps been most interested from a sanitary standpoint during this past year in the many small outbreaks of smallpox that have occurred within our borders. Beginning with an importation to Boulder early in the summer of 1898, there have been successive importations and outbreaks through the whole of the twelve months that have just ended. In a majority of instances the original case of each outbreak came from some point in New Mexico; in a few instances the disease was imported from Old Mexico or Texas. The total number of communities in the state affected by these outbreaks has been not less than forty; the total number of cases has been not less than five hundred. This, occurring in a state that had been for almost ten years practically free from the disease, is a pretty serious showing.

The state board of health has maintained a constant supervision over all of the outbreaks and, in conjunction with most of the local health officers, has succeeded in preventing the disease from assuming great proportions in any given locality. Without going into too great detail and without mentioning specific instances, it is possible to summarize the lessons of the year in a few brief sentences:

First—New Mexico, with its loose administrative methods and half-civilized population, is a constant menace to Colorado, in so far as smallpox is concerned. Either New Mexico should do better or Colorado should establish a strict quarantine against it.

Second—The administration of local health boards in Colorado is not as systematic as it should be, although the efforts of the state board of health are resulting in a constant improvement of service and better coöperation.

Third—The state board of health needs larger appropriations and regularly employed inspectors in order to cover the whole state.

Fourth—The present law does not give the health authorities sufficient control over the railroads in regard to the supervision or prevention of traffic, and the railway officials do not give anything like the whole-hearted support that they should to local health officials in their efforts to prevent the spread of smallpox. Some of the instances in which the disease was spread within the state could not have occurred had the railways given even half-hearted attention to the requests of local health officers for aid.

Three years ago an investigation of many of the dairy herds supplying Denver with milk resulted in the discovery that in almost every herd there were cattle that reacted to the tuberculin test, and in every instance when these cattle were slaughtered gross lesions of tuberculosis could be discovered. While the percentage of cattle so discovered to be affected was small—not exceeding four per cent. in any one herd—it was large enough to call attention to the danger of infected meat and milk. It is necessary that the medical profession of the whole state give their undivided support to the continuance of the official use of the tuberculin test, and that public sentiment be so aroused that no dairyman will dare to venture to sell milk anywhere in this state unless he can present an official certificate that his cows have been tested and found to be free from tuberculosis. In this connection it may not be out of place to suggest that when a cow is tested and found to be healthy, there should be attached to its ear a metal tag bearing a consecutive number, the date of the test, and the name of the responsible board conducting the test. Tagged cattle would then command a better price on the market than untagged cattle. It is possible that in some instances the test should be repeated at the end of five years, in order that assurance might be had of freedom from reinfection.

The committee would urge upon the state board of health the desirability of from time to time holding sanitary conventions in cities in different parts of the state. The presentation of papers to an interested audience by authorities from other cities is often the occasion of an awakening of interest in sanitary matters, resulting in the practical regeneration of a city or district, and especially giving the local health authorities moral stimulus and support that is otherwise likely to be lacking.

The sanitary progress of the whole state requires that the laboratory already established in connection with the state board of health shall continue to be supported, and that its scope of work shall be greatly enlarged. Beginning, as it has done, with the study of the bacteriology of several of the most common of the preventable diseases, it should ultimately embrace in its true line of investigation the chemic and bacteriologic investigation of food and water supplies. The analysis of our many nineral waters and the publication to the world of their various virtues should also constitute a portion of the work of this laboratory.

It is to be hoped that the laboratory may in time prove to be the center about which will be organized a training school in sanitation, where practitioners may take post-graduate courses of instruction in all of the branches that pertain to sanitary work. In several of the Eastern states, notably Ohio and Vermont, such work has already been begun. In New York state a determined effort is being made to establish a state school which shall be under the control of the state board of health, and which shall utilize the tremendous facilities of the large cities in giving to students of sanitation a practical as well as theoretical knowledge of the subject. Colorado can not afford to lag behind in a matter of such import. Nor is there any reason to fear that the medical profession of the state will fail to give its best endeavors to forwarding this most desirable educational advance.

Dr. J. Tracy Melvin, chairman of the committee on medical societies, made the following report, which on motion was adopted:

Your committee would report that the names of fourteen local medical societies appear in the published statement of the

American Medical Association as entitled to representation in that body. These are: The Alumni Association of Gross Medical College, Boulder County Medical Society, Cripple Creek Medical Society, Denver Clinical Society, Denver Clinical and Pathological Society, Denver and Arapahoe County Medical Society, Denver Medical College Alumni Association, El Paso County Medical Society, Fremont County Medical Society, Lake County Medical Society, Las Animas County Medical Society, Practitioners' Club of Denver, Pueblo County Medical Society, Weld County Medical Society.

To these societies there have been added four others, organized in affiliation with the state society since the last report submitted in 1897. These are the Bent county, Larimer county, Morgan county and Otero county societies. Beside the Aspen society, whose decease was reported at your last meeting, the Boulder county, Fremont county and Bent county societies and the Practitioners' Club of Denver are reported as having been in a dormant condition during the past year. Some reports say plainly that they are dead, but we trust that it is only suspended animation.

Efforts to establish local societies have been made during the past year in several other localities, but distances have proved too great and transportation too inconvenient.

The following is a synopsis of the condition and work of the several societies as reported to your committee:

NAME OF SOCIETY	Name of Secretary	No. of Meetings, 1898	Average Attendance	Membership	Gain, 1898.	No. Papers Read	No. of Cases Specimens & Instruments Presented	REMARKS
Alumni Association of Gross Medical College (Incorporated)		....	....	....	....	....	.....	No report
Aspen Medical Society		....	....	....	....	....	.....	Reported as defunct, 1897
Boulder County Medical Society		....	....	....	....	....	.....	Reported suspended
Bent County Medical Society		....	....	....	....	....	.....	Reported defunct
Cripple Creek Medical Society		....	....	....	....	....	.....	No report
Denver Clinical Society	Dr. E. R. Mitchell	15	8⅔	24	8	12	6	Composed exclusively of lady physicians; report much interest and flourishing financially; adopted new constitution and by-laws; made special effort to aid Medical Bill; donated $100 to entertain A. M. A. and $32 to Medical Library Association. Proceedings published in full by Colorado Medical Journal.
Denver Clinical and Pathological Society	Dr. G. E. Tyler	7	25⅔	40	....	....	103	Eighteen visitors were noted; 104 participants in the discussion. Proceedings published in full by Colorado Medical Journal.
Denver and Arapahoe Co. Medical Society	Dr. E. Delehanty	21	48	196	41	22	.....	Eighty participants in the discussions. Proceedings published by Colorado Medical Journal.
Denver Medical College Alumni Association (Incorporated)	Dr. C. S. Elder	12	....	150	....	....	.....	Meetings are held for presentation and discussion of cases only; 30 members only are resident in Denver.
El Paso County Medical Society	Dr. J. O. Reddie	9	11	33	....	9	.....	Refers to their pleasure and benefit in entertaining A. M. A. at Colorado Springs last year.
Fremont County Medical Society		....	....	....	....	....	.....	Reported as suspended
Lake County Medical Society	Dr. E. A. Whitmore	24	8	23	....	....	.....	New constitution; made special effort for Medical Bill.
Larimer County Medical Society		3	....	....	....	4	.....	Organized in 1897, but reported suspended in 1898.
Las Animas County Medical Society	Dr. Jno. Espey	12	9	14	2	13	.....	Interesting social features, including banquet for members and their families.
Pueblo County Medical Society	Dr. J. J. McDonnell	20	15	35	....	....	.....	Papers are read by all members in rotation.
Otero County Medical Society	Dr. H. G. Sigman	12	....	19	....	22	.....	Organized in June, 1898, and flourishing.
Weld County Medical Society	Dr. J. A. Weaver	8	6½	12	....	8	.....	
Morgan County Medical Society		....	....	....	....	....	.....	No report; organized 1897
Practitioners Club of Denver		....	....	....	....	....	.....	Reported as suspended

The following is the list of titles of papers which have been read during the past year, as reported to your committee. Before the El Paso Society: "On the Relation of the Nose to the Stomach," "Twenty Years' Experience With Tuberculosis in Colorado," "Obstetric Experiences," "Puerperal Fever," "Gonorrheal Hip Joint Ankylosis," "Saphenous Varix," "Electric Treatment of Extra Uterine Foetation," "Novel Method of Treating Some Fractures of Humerus."

Before the Pueblo Society, besides papers from their own members was one by Dr. J. N. Hall, on "Aortic Aneurism," and one by Dr. A. S. Lobingier on "Surgical Lesions of the Kidneys."

Before the Weld County Society: "On Peritonitis," "Treatment of Typhoid for the Past Fifty Years," "Points in Examination of Urinary Sediment," "Conservatism in Obstetrics," "Illness and Death Without Known Cause," "Eczema," "Transverse Myelitis."

In addition to these, the papers and discussions of the Denver and Arapahoe County, the Denver Clinical, and the Denver Clinical and Pathological Societies have been published at length as noted in above report, thereby giving the entire profession the benefit.

The meetings of the Western Surgical and Gynecological Society in December, 1897, and of the American Medical Association last year at Denver were events of great interest and value to the profession of the state.

The organization of the Rocky Mountain Inter-State Medical Association in 1897 was an event which we trust will be successful in uniting in a special way the practitioners of our mountain states in an influential body bound by many ties of common interest.

The Colorado Medical Library Association also deserves more than a passing notice at your hands for the untiring efforts put forth by its officers during the past year to provide the profession of the state with a comprehensive working library available to all.

Dr. Tyler—I wish to make one correction in reference to the Denver Clinical and Pathological Society. There are never any papers read before this society. I presume that was the reason Dr. Melvin was unable to get at that fact.

Dr. Whitney—I would like to state that Mr. Oakes, of the Consumptives' Home in North Denver, has extended a very earnest invitation to the Medical Society to visit that institution. It seems that it would be impracticable to go there as a society this year, but probably next year suitable arrangements can be made for such a visit, and I would like to make the suggestion to the executive committee for next year.

The first paper of the morning was by Dr. P. D. Rothwell, of Denver, whose subject was, "What the Medical Profession and People of Colorado Need More Than a Medical Bill." This was discussed by Dr. E. Stuver, Dr. R. LeMond, Dr. Jessie Hawes, Dr. J. W. Hawk, Dr. Frank Finney, Dr. Minnie C. T. Love, Dr. W. P. Munn, Dr. J. M. Blaine and Dr. Leonard Freeman. Discussion closed by Dr. P. D. Rothwell.

The next paper was by Dr. Frank Finney, La Junta, on "Bone Necrosis Following Typhoid Fever," which was discussed by Dr. Leonard Freeman and Dr. J. N. Hall.

The next papers presented were "The Prevention of Communicable Diseases in Colorado," by Dr. G. E. Tyler, Denver, and "Some Problems in Rural Sanitation," by Dr. J. Tracy Melvin, Saguache, which were discussed by Drs. J. N. Hall, M. Harrison, A. D. Marks and Jessie Hawes. Dr. Tyler closed the discussion.

The next paper was by Dr. Leonard Freeman, Denver, whose subject was "Surgical Diseases of the Kidneys: Cases Illustrating Points in Diagnosis and Treatment." It was discussed by Dr. H. G. Wetherill and discussion closed by Dr. Leonard Freeman.

The President—The time has arrived when the nominating committee should be selected. Of how many shall it consist and how shall they be selected?

Dr. Powers—I move that it be made a committee of five, Mr. President, to be nominated from the floor, not more than two from Denver and three from other parts of the state.

Motion carried.

Dr. Powers—I nominate Dr. H. T. Pershing.

Dr. Tyler—I nominate Dr. Leonard Freeman.

Dr. Stevens—I nominate Dr. Hawes of Greeley.

Dr. Black—I would like to nominate Dr. McHugh of Fort Collins.

Dr. Stuver—I would like to nominate Dr. Finney.

Dr. Hawes—Let me withdraw. We now have the north represented by two living close together, and the south has no representation.

Dr. Hawes withdrew and Dr. Sol Kahn of Leadville was nominated in his place.

Dr. Hall—I move that the nominations be closed and that the secretary cast the ballot of the society for those gentlemen as members of this committee.

Motion carried, and the secretary announced the election of those nominated.

The hour of 11:30 having arrived, pursuant to the motion made at the beginning of the session, the "Address in Medicine," by Dr. Robert H. Babcock of Chicago, on Arterio-Sclerosis, was listened to at this time.

Dr. Rogers—It is not often in this society that we have the pleasure of listening to an address in medicine by one who has made the particular subject the study of a life time, and it gives me much pleasure, therefore, to move a vote of thanks to Dr. Babcock for the address he has given us, to be taken by a standing vote.

Motion carried unanimously and with much applause.

The secretary read the following telegram from Dr. Robert Levy:

"Iron Mountain, Mich., June 20, 1899.

"Greeting to president and Colorado State Medical Society. Regrets. LEVY."

Society adjourned till 2 o'clock.

AFTERNOON SESSION.

Meeting called to order by Second Vice President Sol Kahn. The first paper presented was by Dr. Carroll E. Edson, of Denver, on "A Case of Septicaemia Treated with Normal Salt Solution," which was discussed by Dr. C. A. Powers.

The next paper read was by Dr. H. T. Pershing, of Denver, entitled "Causes of Vertigo." Discussed by Drs. Edward Jack-

son, G. M. Black, E. Stuver and discussion closed by Dr. H. T. Pershing.

The next paper read was on "Functional Affections of Joints," by Dr. George B. Packard, of Denver, which was discussed by Dr. J. T. Eskridge.

Dr. S. D. Hopkins, of Denver, read the next paper, entitled "Extra-Dural Spinal Meningeal Hemorrhage, with Report of a Case," which was discussed by Dr. J. T. Eskridge.

The next paper read was entitled "Tetanus Treated by Anti-Tetanus Serum: Recovery," by Dr. T. E. Taylor, Denver.

All of the papers in the symposium on lacerations of the uterus, vagina and perineum were now read before any discussion was had, as follows:

"The Varieties: Their Causes and Prevention," Dr. R. W. Corwin, Pueblo.

"Symptoms and Sequels of Fresh Lacerations," Dr. J. Hawes, Greeley.

"Immediate Repair: Indications, Methods and Technique," Dr. Sol Kahn, Leadville.

Symptoms and Sequels of Old Lacerations: (a) "Local," Dr. I. B. Perkins, Denver; (b) "Nervous," Dr. J. T. Eskridge, Denver.

Treatment of Old Lacerations and Their Sequels: (a) "Surgical Treatment of Lacerations of the Cervix, Vagina and Perineum," Dr. W. A. Jayne, Denver; (b) "Surgical Treatment of Uterine Displacements Resulting from Lacerations of the Pelvic Floor," Dr. C. K. Fleming, Denver. Dr. Fleming being absent, on motion of Dr. Wetherill, the paper was read by title and to be published in the transactions.

"Obstetric Lacerations of the Uterus, Vagina and Perineum," Dr. T. Mitchell Burns, Denver.

The papers in the symposium were discussed by Drs. H. B. Whitney, W. W. Grant, R. W. Corwin, T. E. Taylor, H. G. Wetherill, Jessie Hawes, T. Mitchell Burns, Sol Kahn and I. B. Perkins.

The next paper read was by Dr. M. McNeelan of Basalt, entitled "Cholera Infantum."

Dr. Charles Denison of Denver read the next paper, entitled "Traction Plasters for Temporarily Contracting an Affected Lung, in Lieu of the Murphy Operation."

On motion the society adjourned till 8:30 this evening.

EVENING SESSION.

Society called to order by Second Vice President Sol Kahn.

This session was devoted to a symposium on "Gall-Stones," and the following papers were read:

"Anatomical Consideration of the Region Involved in Surgical Operations on the Gall-Bladder and Bile Ducts," by Dr. H. E. Warren, Denver.

"Pathology," Dr. W. H. Bergtold, Denver.

(President Campbell called to the chair.)

"Symptoms and Complications," Dr. Carroll E. Edson, Denver.

"Differential Diagnosis," Dr. P. J. McHugh, Fort Collins.

"Surgical Management of Calculi in the Gall-Bladder," Dr. E. J. A. Rogers, Denver.

"Surgical Management of Calculi in the Biliary Ducts," Dr. Clayton Parkhill, Denver.

The president asked Dr. John B. Roberts, of Philadelphia, to open the discussion, who complied with the request. The symposium was also discussed by Drs. R. W. Corwin, Leonard Freeman, E. R. Axtell, C. A. Powers, W. W. Grant, E. Stuver, H. E. Warren and E. J. A. Rogers.

Society adjourned until 9 a. m. to-morrow morning.

THURSDAY, JUNE 22.

MORNING SESSION.

Society called to order by the president at 9:30.

The first paper presented was by Dr. B. A. Arbogast, of Breckenridge, on "Relative Influence of Diet on Intemperance."

The next paper read was entitled "Abortion: Its Sequelæ and Treatment," by Dr. P. J. McHugh, Fort Collins. This paper was discussed by Drs. C. B. Van Zant, W. E. Wilson, Minnie C. T. Love, B. A. Arbogast, M. Harrison, H. G. Wetherill, Sol Kahn and W. J. Rothwell. Dr. P. J. McHugh closed the discussion.

The next paper on the program was entitled "Simple Methods of Bacteriological Diagnosis in Diphtheria," by Dr. H. R. Bull, Grand Junction.

Dr. Whitney—I have received a telegram from Dr. Bull, saying he will be unable to be present, and I move that his paper be read by title and printed in the Transactions.

Carried.

Dr. J. M. Blaine, of Denver, read the next paper, entitled "Rational Treatment of Gleet."

This was followed by a paper entitled "Protargol in the Treatment of Gonorrhœal Urethritis," by Dr. H. E. Warren, Denver.

The papers of Drs. Blaine and Warren were discussed by Drs. Arbogast, H. E. Warren, W. J. Rothwell, W. P. Munn, G. M. Black, C. A. Powers and J. M. Blaine.

Dr. E. J. A. Rogers, of Denver, read the next paper, on "Resection of the Large Intestine," which was discussed by Drs. John B. Rogers, of Philadelphia, and E. J. A. Rogers.

The next on the program was an "Address in Surgery: The Satisfactory Results Obtainable by Operative Treatment in Disfiguration of the Face and Ears," by Dr. John B. Roberts, of Philadelphia.

Dr. Powers—We have all enjoyed most exceedingly this most interesting address of Dr. Roberts. He has come very many miles to give us this treat, and we are duly grateful. I move you, sir, that the society tender Dr. Roberts a vote of thanks, and I move you further that Dr. John B. Roberts and Dr. Robert H. Babcock be made honorary members of our society.

Seconded.

The President—The first in order will be the vote of thanks.

This was carried by a unanimous rising vote.

The President—We have the motion before the house that Drs. Roberts and Babcock be made honorary members of our society. All in favor of this motion please rise.

Carried by a unanimous rising vote.

The last paper of the morning session was by Dr. Geo. W. Miel, of Denver, whose subject was "Outline Records and Extension, after Injury of the Elbow Joint." This paper was discussed by Dr. Roberts, of Philadelphia.

Dr. Munn—I desire to move that Dr. Powers' paper on "The Establishment of a Central Laboratory of Pathology in Denver," be made a special order of business at 3:15 this afternoon, fifteen minutes before the president's address.

Carried.

Dr. Roberts, at the request of the society, spent a few moments illustrating his paper by blackboard drawings, and illustrating Dr. Hawes' nose splint.

Society adjourned until 2 o'clock this afternoon.

AFTERNOON SESSION.

Meeting called to order by the president.

Dr. Hall—Mr. President, I received this letter, which is self-explanatory, from Dr. Bayard Holmes, secretary of the Association of American Medical Colleges:

"Association of American Medical Colleges,
"Secretary's Office,
"November 1, 1898.

"My Dear Dr. Hall: In view of the recent ordinance which amends the by-laws of the American Medical Association, by en-

larging the conditions excluding representation in that body, thus giving full recognition to the minimum standard requirements of the American Medical Colleges Association, I would beg your attention to the importance of having this action endorsed, by making it a part of the rules governing your state society and its auxiliaries. By securing coördinate action in this matter in your state society and in the large auxiliary societies, the cheap and easy methods of gaining access to the medical profession would be most effectually cut off.

"Will you there take it upon yourself to secure united action upon the part of the faculties and friends of the reputable medical schools in your city and state by the appointment of an active committee before your state society, and promptly disseminate in your community full knowledge of the action of the American Medical Association? You will thus greatly aid in the consummation of this great reform in American medical education.

"Anxious to hear from you on this subject, I am,

"Faithfully and fraternally yours,

"BAYARD HOLMES, M. D., Secretary."

In accordance with that letter Dr. Edward Jackson and I wish to offer the following amendment to section 1 of article II. of the by-laws: After the words "regular medical college," strike out the words "of good standing," and insert the words "the requirements of which conformed to those for membership in the American Medical Association at the time the diploma was issued." So that section 1 will read: "Every candidate for membership in the Colorado State Medical Society shall make a written application to the committee on admission, and such application shall be accompanied by a diploma or certificate vouching for possession of the same from some regular medical college, the requirements of which conformed to those for membership in the American Medical Association at the time the diploma was issued, and his reputation shall be vouched for, in writing, by at least two members of the society."

Dr. Wetherill—I second the resolution.

The president called for a rising vote on the resolution, and the secretary announced that all the members present voted in favor of the resolution, which was declared duly carried.

The president called for the report of the committee on medical ethics. Dr. J. N. Hall, chairman of the committee, being absent from the room, Dr. Wetherill read the report, which is as follows:

"The committee on medical ethics report that the charges against Dr. E. W. Kearby, of Cripple Creek, were not sustained, and he is completely exonerated. None of the other matters referred to your committee demand report at this time."

On motion the report was adopted and placed on file.

The next order of business was the reading of a paper on "The Treatment of Pelvic Suppurations," by Dr. H. G. Wetherill, of Denver.

The next paper was by Dr. I. B. Perkins, of Denver, on "Tubal Pregnancy and Dermoid Cyst, with Report of a Case."

These papers were discussed by Drs. H. G. Wetherill and I. B. Perkins.

The next paper read was by Drs. Minnie C. T. Love and John Chase, of Denver, on "Report of a Cured Case of Hystero-Epilepsy."

Dr. I. B. Perkins, chairman of the committee on necrology, submitted the following report, which was adopted and ordered placed on file:

Your committee on necrology beg to inform you that four members of this society have died since our last meeting.

Dr. H. C. Crouch, of Denver, died April 20, 1898, of pulmonary tuberculosis. He had been a member of this society six years, during which time he was active in all of its work, but more especially in the field of bacteriology and pathology. He was one of the earliest American workers in this field, and although a sufferer for years from tuberculosis, he kept up his active labors until his death, spending his last few years in the study of contagious diseases. In his death the state of Colorado, and especially the city of Denver, have lost a benefactor.

Dr. John C. Herrick, of Denver, died September 30, 1898, of pneumonia. He came to Colorado from Southampton, Long Island, nine years ago on account of failing health, and joined this society in June, 1891. He was active in professional work up to within four days of his death. He was born in Southampton in 1844, graduated in medicine from Yale College and Long Island

College Hospital. It was my good fortune to know him well. He was a quiet, cultured man, whom every one loved; one of those rare men of whom it is safe to speak without reserve. His life was a constant inspiration to the younger members of the profession, many of whom feel that his death is a personal loss.

Dr. Jesse W. Dawson, of Cañon City, Colo., died January 8, 1899, from the result of an accident received on December 4, 1898. He was thrown from his buggy while hurrying to the bedside of a suffering patient, and sustained a fatal fracture of the skull. He had been a member of this society for more than twenty years, and nearly always attended its meetings. He was a graduate of Rush Medical College, Chicago, class of '71. He located in Cañon City in 1875 and practiced medicine and surgery there up to the time of his accident. He was a man of noble impulses, and his name is closely connected with the history of his adopted home. Those who knew him best speak of him in the warmest terms.

Dr. Lee Kahn, of Leadville, Colo., died early in February of 1898, of some obscure stomach and bowel trouble. He was born in Morrison, Ill., in 1867, graduated in medicine from Rush Medical College, Chicago, in 1889, joined this society in 1895, and the same year was elected one of its vice presidents. He was secretary of the section of physiology and dietetics of the American Medical Association at the time of his death. He was a young man of much promise, and in his death this society loses one of its most earnest and energetic members.

Dr. Hugo Mager died July 18, 1898, from a fracture of the base of the skull. He was struck by a runaway team and thrown from his buggy while attending to his daily duties. Dr. Mager was 48 years of age, and a graduate of Northwestern Medical College, graduating in 1883. He joined this society in 1895. He had a large practice and devoted himself mostly to surgery. He had a large circle of friends and was a genial companion.

In his death this society loses one of its most active members and an ardent advocate of whatever appeared to him to be the right.

Dr. W. P. Munn, one of the members of the auditing committee appointed by the president to examine and report upon the accounts of the treasurer, reported as follows: "The committee

examined the treasurer's books and found them to be correct and the balance properly stated, and recommend that the treasurer's report be received and approved."

Seconded by Dr. Wilson and carried.

Dr. Kahn—While we are waiting for the committee on admissions to report, I would like to hear something from the committee which was appointed a year ago, on legislation. I believe there was a committee of that kind appointed.

The President—I will say that the committee on legislation appointed a year ago consisted of Drs. W. A. Jayne, S. E. Solly, J. W. Graham, A. Stedman, W. W. Grant, A. K. Worthington and E. J. A. Rogers. This committee found it necessary to be increased to double this number to be enabled to push through the legislature the bill that was framed and presented. Dr. Jayne, finding that he would not be able to devote the time to it that he desired, tendered his resignation as chairman of this committee, and Dr. C. K. Fleming was put upon the committee as chairman. Dr. Fleming is now out of the city. I believe the only members of the committee now present are Drs. Love and Rogers. If Dr. Rogers can give us some light on this matter we would be glad to hear from him.

Dr. Rogers—I know very little about it. Two meetings were all I attended. But you all know the result. The legislature passed the bill which was satisfactory to most of the members of the committee, but the governor in his great wisdom saw fit to veto the bill. I think it would be quite proper to commend the work of Dr. Fleming, especially, and those who were energetic with him, in some resolution which indirectly would express the idea of the society on the action taken by the executive of this state in vetoing the bill.

Dr. Wilson—I move that the thanks of the society be returned to Dr. Fleming and his committee on legislation. I have been on similar committees myself in the past and know how arduous and how unpleasant many of those duties are; and in this resolution I would also embody the idea that if there has been a necessity for the expenditure of any money by this committee in promoting the objects for which it was appointed, they be requested to send in their bill for the same and the society pay it.

Dr. Solly—I would second that motion, and I would like to add, with Dr. Wilson's consent, the names of Dr. Jayne and Dr. Hopkins. I was with the committee a great deal and I know probably more of the commendable work which they did than the other members who are present.

Dr. Perkins—I would like to amend the motion to this effect, that a committee of three be appointed by the chair to draft suitable resolutions, in order that it may not be done off-hand. It ought to be very carefully worded, because of the touching on a tender spot of the highest official in the state, and it ought, of course, to be very carefully handled—his feelings ought not to be wounded. He has the best interests of the state at heart, trying hard to advance certain portions of the population of the state, and I think for that reason this committee ought to be appointed.

Amendment seconded and carried.

The president then appointed Drs. W. E. Wilson, I. B. Perkins and Sol Kahn on the committee.

Pursuant to resolution adopted this forenoon, the society at this time listened to a paper by Dr. C. A. Powers, of Denver, on "The Establishment of a Central Laboratory of Pathology in Denver," which was discussed by Drs. W. P. Munn, Carroll E. Edson, E. J. A. Rogers, John R. Espey and C. A. Powers.

Dr. Jackson—To bring the matter fairly before the society, I move that a committee of five be appointed by the incoming president to consider the advisability of a laboratory for pathological work, the laboratory to be located in Denver.

Motion carried.

On motion, duly seconded and carried, the following papers were ordered read by title and printed in the record: "Rheumatism," by Dr. S. J. Hubbell, of Fort Lupton; "Anent an Urgent Duty of the Profession," by Dr. B. Oettinger, of Denver; "Vaccination," by Dr. R. K. Hutchings, of Colorado Springs; and "A Report," by Dr. R. W. Corwin, of Pueblo.

The next order of business was the president's address.

Following the address, in the absence of Dr. Hawes, chairman of committee of admissions, the report of that committee was made by Dr. Robinson, as follows:

Seventeen names have been reported to the committee, all of which have been recommended. Fifteen of those have been printed, two have come in since the list was printed, and the secretary will place them on the board so that you can add them to your list. The names are as follows:

F. R. Coffman.....Minturn, Colo.
Chas. S. Orr.....Alamosa, Colo.
J. A. Farnsworth.....Fort Morgan, Colo.
E. W. Stevens.....Denver, Colo.
R. H. Denney.....Elbert, Colo.
Chas. B. Van Zant.....Denver, Colo.
John G. McFadden.....Loveland, Colo.
Philip Hillkowitz.....Denver, Colo.
D. F. Dayton.....Trinidad, Colo.
P. T. Rucker.....Basalt, Colo.
S. Z. Coman.....Boulder, Colo.
Hobart E. Warren.....Denver, Colo.
John A. Burroughs.....Ashville, N. C.
Maurice Kahn.....Leadville, Colo.
Bernard Oettinger.....Denver, Colo.
A. H. Williams.....Denver, Colo.
H. R. Elliott.....Denver, Colo.

The president appointed Dr. Leonard Freeman and Dr. C. D. Spivak as tellers to collect and count the ballots.

The tellers reported that there were two negative votes cast, one for each of two names, and the rest were all unanimously "yes." Thereupon the president declared the seventeen whose names had been voted upon duly elected members of the society.

The report of the committee on nominations was presented by Dr. Pershing, as follows:

The committee on nominations names the following candidates:

For President—

Dr. J. N. Hall, Dr. W. P. Munn, Dr. Edward Jackson, all of Denver.

For First Vice President—

Dr. P. J. McHugh, of Fort Collins, Dr. R. W. Corwin, of Pueblo, and Dr. B. A. Arbogast, of Breckenridge.

For Second Vice President—
Dr. L. O. Maffett, of Colorado Springs.
For Third Vice President—
Dr. M. Harrison, of Boulder.
For Corresponding Secretary—
Dr. H. B. Whitney, Dr. S. D. Hopkins, Dr. Edward Delehanty, all of Denver.
For Recording Secretary—
Dr. Minnie C. T. Love, of Denver.
For Assistant Recording Secretary—
Dr. W. T. Little, of Cañon City.
For Treasurer—
Dr. W. J. Rothwell, Denver; Dr. J. M. Blaine, Denver; Dr. E. P. Hershey, Denver.
Committee on Admissions—
Dr. C. K. Fleming and Dr. W. W. Grant, of Denver; Dr. J. Tracy Melvin, of Saguache, and Dr. M. McNeelan, of Basalt.
Trustees—
Dr. Samuel A. Fisk, Denver; Dr. W. R. Whitehead, Denver; Dr. Arnold Stedman, Denver; Dr. W. E. Wilson, Denver; Dr. Hubert Work, Pueblo; Dr. S. E. Solly, Colorado Springs, and Dr. J. T. Eskridge, Denver.

Moved, seconded and carried that the report of the committee on nominations be received and the committee discharged.

Dr. Hershey—I move that the nominations be closed.

Carried.

The President—You will proceed to prepare your ballots for president.

Dr. Jackson—I have the best of feelings towards the committee, but I feel that it would put me in a position that I should not be in. I do not know whether this is customary as a part of the welcome to a new man to Colorado or a part of the ceremonies of initiation into the State Society, but whatever it is, I think it would be proper for me to withdraw my name, and I do withdraw my name as a candidate for president.

Dr. Munn—However great an honor it may be to be a candidate for the presidency of the society, I have certainly no de-

sire or wish to contest with my friend, Dr. J. N. Hall, and I desire to withdraw my name, and to move you, sir, that the secretary be instructed to cast the ballot of the society for Dr. J. N. Hall.

Carried.

The secretary announced that she cast the ballot of the society for Dr. J. N. Hall, of Denver, for president.

The president declared Dr. J. N. Hall duly elected as president of the society, and appointed Drs. Munn and Jackson to escort the newly elected president to the chair, which was done amid great applause, and in response to cries of "speech," "speech," Dr. Hall addressed the society as follows:

Mr. President and Members of the Society—The president informs me that I am to make a speech at once. I know that there is one association in this city that will rejoice exceedingly at this thing, and that is the one of stenographers of the law courts, because—although you do not at present, I know, see the connection, you will see it in a moment—when they get a real, red-hot murder trial and the cross-examining attorney begins to stick it to me pretty hard, whenever a little lull comes in the proceedings, the stenographer leans over and says: "For the love of heaven, doctor, if you can, talk just a little slower." Now, these stenographers will be very glad indeed to know that they finally got me up against a stump where I absolutely had no words in which to express that which I wished to say; for I must admit that if I had as many words in my vocabulary expressive of the depth of my feelings as the ordinary Pueblo patient has gall-stones in his gall-bladder, I should still be utterly unable to meet the situation.

Really, gentlemen, I feel a good deal of diffidence in taking a place which has been held by so many of those who have preceded me. When I think of the venerable men who nearly thirty years ago founded this society, who planned the establishment of the State Medical Society in this great wilderness, I feel a great deal of diffidence in accepting the situation. It is a great pity that one who has this honor given to him should not have two or three weeks in which he might be able to prepare something to say worthy of the occasion.

There is one thing, however, which I know must be in the minds of all present and which our president has already touched upon, and I feel as if I might give that particular subject an additional twist. It is that we doctors do not take hold of one subject as we ought to, and that is the subject of politics. I am not going to burden you very long, but I want to say one thing: We ought during the next year or two to have something to say so that when the legislature meets we shall be able to obtain what we want. One of the faults of our republican form of government (which I think I admire as much as anybody, but still it has its faults) is that people rise to power—whether it be in our city governments, or in the legislature, or our gubernatorial chair—and then, with an increasing thirst for power, wish to stay there. The result is that they are continually attempting to trim to each passing breeze of public opinion. They wish all the time to please everybody. As a consequence they are likely sooner or later to lose all real individuality. The man who in any of these positions attempts all the time to please everybody soon loses all of his own force of character. He eventually comes to have no more real individual weight in directing the current of political events than did those Merovingian kings of France a thousand years ago, when they nominally, but the mayors of the palace really, ruled the Franks. They have no more of the real essence of power than did those petty princes of the Punjab and the Coromandel coast, seven score years ago, when the affairs of all India lay in the grasp of one man, the most masterful Englishman since the days of Cromwell, Lord Clive; for you will remember that he made and unmade kings and princes exactly as we make the pawns and kings on the chess-board in our own parlors. We have got to do something with politics. We have got to make ourselves felt. And we can do it. I have practiced in a small town where I knew something of the intricacies of the festive caucus and even at times attended the mal-odorous county convention. I know very well that all of us can, if we will only go into these places, make ourselves felt, and exert an influence for good in the political situation, and when we wish for something we will not be brushed aside. When the newspapers demand something they

have the power to cut off the politician's neck if he don't give it to them. We must make ourselves felt in that direction.

Gentlemen, I know you will excuse me, unprepared as I am, from anything further in an attempted speech. I thank you for your attention. (Great applause.)

The President—You will now prepare your ballots for first vice president.

The tellers reported that there were 54 votes cast, of which Dr. P. J. McHugh, of Fort Collins, received 27; Dr. R. W. Corwin, of Pueblo, 21, and Dr. B. A. Arbogast, of Breckenridge, 6.

The President—As Dr. McHugh has received a plurality of the votes cast, I declare him the duly elected first vice president for the ensuing year.

Dr. Robinson—I move that the secretary be instructed to cast the ballot of the society for Dr. L. O. Maffett, of Colorado Springs, for second vice president.

Carried.

The secretary announced that she cast the ballot of the society for Dr. L. O. Maffett, of Colorado Springs, for second vice president, who was thereupon declared to be duly elected.

Moved by Dr. Simon that the secretary be instructed to cast the ballot of the society for Dr. M. Harrison, of Boulder, for third vice president. Carried.

Thereupon the secretary announced that she cast the ballot of the society for Dr. M. Harrison for third vice president, who was declared duly elected.

Dr. Hopkins—I desire to withdraw my name as a candidate for the office of corresponding secretary.

Dr. Delehanty—I desire to withdraw my name, and move that the secretary be instructed to cast the ballot of the society for Dr. Whitney.

The secretary announced that she cast the ballot of the society for Dr. H. B. Whitney, of Denver, who was thereupon declared to be duly elected to the office of corresponding secretary.

Dr. Powers—I move that the president be instructed to cast the ballot of the society for Dr. Minnie C. T. Love for recording secretary.

Carried.

The president announced that he cast the ballot of the secretary for Dr. Minnie C. T. Love, of Denver, for recording secretary, and she was thereupon declared duly elected.

There were cries of "speech," "speech," and Dr. Love responded by saying: "I do not think it is quite fair to ask me to make a speech, and I am not going to. I presume the reason you put me in for a third term is because you are not good politicians. That is one reason. Perhaps another is, you want a little 'love' here to leaven the whole lump."

It was moved, seconded and carried that the secretary be instructed to cast the ballot of the society for Dr. W. T. Little, of Cañon City, for assistant recording secretary.

The secretary announced that she cast the ballot of the society for Dr. W. T. Little for assistant recording secretary, who was thereupon declared to be duly elected.

Dr. Blaine—Thanking the committee for nominating me for treasurer, I respectfully withdraw.

Dr. Hershey—I also desire to withdraw my name as a candidate for treasurer.

Dr. LeMond—I move that the secretary be instructed to cast the ballot of the society for Dr. Wm. J. Rothwell for treasurer.

The secretary announced that she cast the ballot of the society for Dr. Wm. J. Rothwell, of Denver, for treasurer, who was declared duly elected.

There were cries of "speech," "speech," and Dr. Rothwell responded as follows: "The question is which of the Rothwells it is that ought to make the speech. My duty is to keep with great care the funds of the society, which I shall do to the best of my ability and keep silent. The great monied men are not talkers."

Dr. Tyler—I move that the secretary be instructed to cast the ballot of the society for Dr. C. K. Fleming, Dr. W. W. Grant, Dr. J. Tracy Mélvin and Dr. M. McNeelan for members of the committee on admissions.

Carried.

The secretary announced that she cast the ballot of the society for Dr. C. K. Fleming, Dr. W. W. Grant, Dr. J. Tracy Melvin and Dr. M. McNeelan, who were thereupon declared to be duly elected as members of the committee on admissions.

Dr. Spivak—I move that the secretary be instructed to cast the ballot of the society for Drs. Samuel A. Fisk, W. R. Whitehead, Arnold Stedman, W. E. Wilson, Hubert Work, S. E. Solly and J. T. Eskridge as trustees for the ensuing year.

Carried.

The secretary announced that she cast the ballot of the society in accordance with the motion, and those named therein were declared to be duly elected trustees for the ensuing year.

Dr. Spivak—I wish to offer the following resolution or motion: "That a committee of five shall be appointed by the incoming president, whose duty it shall be to coöperate with similar existing committees or hereafter to come into existence committees of other state medical societies for the purpose of publishing and distributing either periodically or from time to time such literature as will expose to the victimized public the folly, delusion, wickedness and criminality of the advertising quacks and abortionists, and of all systems of alleged healing which are not based upon scientific principles."

Motion carried unanimously.

Dr. Denison—I wish to introduce a resolution which I will ask our new president to put to the convention, and I am sure that in doing this I confer a favor upon every member of the society in giving him an opportunity to endorse, as I think we all do, the excellent expressions of our retiring president in the first half of his address. I therefore move that the society tender a vote of thanks to our retiring president for his excellent address.

Motion carried unanimously.

The committee appointed by the president to draft resolutions of thanks to the legislative committee presented the following report:

"Whereas, A legislative committee consisting of Drs. W. A. Jayne, S. E. Solly, J. W. Graham, A. Stedman, W. W. Grant, A. K. Worthington and E. J. A. Rogers was appointed by The Colorado State Medical Society in June, 1898, and was later increased by the addition of Drs. C. K. Fleming, S. D. Hopkins, Minnie C. T. Love, E. P. Hershey and R. Levy, to further legislation for the elevation of the standard of admission to medical

practice and the restriction of systems of dishonest pretense; and,

"Whereas, The committee by its devoted and disinterested labors succeeded in passing through the legislature and in bringing before the governor a bill designed to exalt the qualifications necessary to the practice of medicine in Colorado; therefore, be it

"Resolved, That in the opinion of this society the unity of the profession has been furthered and its highest aims advanced by the work of the legislative committee, and the thanks of this society are hereby rendered to its members.

"W. E. WILSON,
"I. B. PERKINS,
"SOL G. KAHN,
"Committee."

Dr. Denison—I move the adoption of the resolutions.

Carried.

Dr. Blaine—I move you that a vote of thanks be extended to the management of the Brown Palace hotel for their courtesy in giving us the use of these rooms for our meetings.

Carried.

Dr. Wilson—I also move that the thanks of this society be returned to all the officers of the association for their devotion and earnest effort to promote the interests of the society.

Carried.

Dr. Spivak—I move that a committee of three be appointed whose duty it shall be to request all medical societies of the state of Colorado to devote one regular or special meeting to the discussion of the question of establishing a local medical library, or, if that is not feasible, of increasing the efficiency and membership of the largest medical library of the West, The Colorado Medical Library Association located in Denver, Colo.

Dr. Jackson—I would be very glad to second that motion. I think there is but one opinion about the value of a medical library, or the duty of medical men in supporting medical libraries.

Dr. Freeman—I should like to say that the medical library, as you all know, will soon move into new quarters. We expect to do very much more in the future than has been done in the past. We want to go into the new quarters with everything in

proper shape. There will be many expenses to be borne, shelving to put up, new binding to be done, etc. There are many pamphlets, etc., now lying in the basement covered with dust simply for the want of space, and we want to get into the new quarters with everything in such shape as will make the library of the greatest possible usefulness to all.

Dr. Bane—It seems to me that the State Society might appropriate some funds towards the library. I simply make the suggestion.

Dr. Spivak—I think Dr. Bane has brought up a very nice suggestion. The only question is the state of the treasury. If the treasury is in good condition, I really do not see why some one should not move that a certain sum be given to this library. This library is not a library for the city of Denver. It is a library which is for the whole state—not only for the state, but even for adjoining states. The rules of the library are such that any one can become a member by paying three dollars a year, be he a resident of the city of Denver or outside of Denver, or even of an adjoining state. If a gentleman outside of Denver sends in his request for certain books or journals, the same are shipped to him by the librarian. Therefore the library is almost as accessible to one outside of Denver as in Denver.

The President—There is no motion before the house.

Dr. Spivak—I move that this society, in order to show its sympathy with the library and the necessity of a library in the state of Colorado, appropriate $20 towards the library. I take the smallest sum simply to bring it on record that this society has done something for the library and is willing in the future, when its treasury shall be in a better condition, to give more.

Dr. Perkins—I second Dr. Spivak's motion, because I believe this society should foster and help out the library. As the doctor said a few moments ago, it is not a library for the city of Denver, but it is probably of more benefit to those members outside of Denver than those in Denver, because any book that one of us might want some friend will have who would be glad to lend it to us.

Dr. Bane—I move to amend the motion by making it $50 instead of $20.

Dr. Miel—While we are all in sympathy with the library and all would be glad to take something from our treasury to assist the library, it does not seem to me to be a wise thing to do. All the members of this society may become members of the library by paying a certain subscription, and that membership entitles them to certain privileges. I do not think it would be wise to take any money from our treasury at present, considering the condition that our treasury is in.

Dr. Wetherill—I do not know whether in doing this we are within our constitutional rights. This certainly would be a diversion of the funds of the society from the legitimate purpose for which those funds are collected, and all of which the members of the State Society have given. I do not believe that this action should be taken without the thorough knowledge beforehand that we are clearly within our constitutional rights in doing so. I am in sympathy with the library, and I believe that we ought to foster the library and strengthen it and support it in every possible way; but personally I believe that this diversion of funds from the State Society to a Denver institution without at least the coöperation of a very large proportion of the out-of-town men might very reasonably be considered unfair and somewhat unjust to them; and, while I should very much like to see the library have this money, and on my part be very glad to have it appropriated from the funds of the society, I believe that it would be establishing a bad precedent, and I am sorry to say that I can not vote for it.

Dr. Perkins—I simply rise to say that this would not be establishing a bad precedent, because some two or three years ago this society appropriated one or two hundred dollars—I forget the exact amount—for this same identical purpose.

Dr. Stuver—I am an outside man, but at the same time I think that the medical library, even though located in the city of Denver, ought to be supported to the fullest of our ability. I do not expect to use any of the books myself, but I fully appreciate the fact that a medical library will be a great stimulus to original investigation on the part of those who do live where they can use it, and for that reason I think that the small amount suggested could be spent in no better way than to foster and

lay the foundation for a good library, in resurrecting from the dust-heap valuable contributions that might be put to good use by men who probably have not the means of acquiring large libraries. I have lived in a truly western country for twenty years, and I fully appreciate the difficulty that a man labors under who must depend on his own resources for his library facilities, and I believe that every man who is imbued with the true scientific spirit in this state would heartily consent to the use of a certain amount of money of this society in promoting the foundation of a good medical library in Denver.

Dr. Work—Like Dr. Stuver, I, too, practice in the country, but I have had some knowledgs of the financial affairs of the State Medical Society. It has been my experience and the experience of every one who has been president of this society heretofore that there were not enough funds to pay the legitimate, necessary expenses of the society. I am personally opposed to the appropriation of one dollar; for one reason, the library is not accessible to the great majority of the members of the society. If the gentleman insists upon his motion, I am willing that it should be left for another year for the consideration of the society. As a member of the board of trustees I would oppose the appropriating of any money belonging to the society, and I very much doubt if the money can be appropriated by vote of the society for that purpose. I therefore would move that the motion be tabled for the present.

Seconded by Dr. Wetherill and carried.

President Campbell—I want to return my personal thanks to each and every member of the society for the hearty support they have given me during this meeting by their presence and by the valuable papers they have submitted to the society for its consideration. It has been quite a satisfaction to me to have this hearty support, coming, as it has, from the profession so universally over the state. I feel that I am turning over to my successor the society in a very good and lively condition, and I hope and pray that the future meetings may improve as this has done over meetings in the past, that our scientific work may go on in the future improving in amount and in quality, and that Colorado may be accounted as having one of the thriving,

growing, progressive and aggressive state societies of the United States. Thanking you for the courtesy, we will now entertain a motion for adjournment.

Dr. Wetherill—I move that a committee of three be appointed by the incoming president to consider the advisability of having certain meetings of the society, one in three or five years, outside of the city of Denver, in some other portion of the state, with the hope that it will interest men outside of the city of Denver, and that such committee make a recommendation at its next meeting.

Carried.

On motion of Dr. Tyler the society adjourned sine die.

BY-LAWS.

ARTICLE I.

MEMBERS.

Any regular graduate of medicine and surgery may become a member of this society, who, by his adherence to the Code of Ethics of the American Medical Association, shows himself entitled to the confidence and fellowship of his medical brethren, and who, by his general conduct and mode of life, proves himself worthy of being a member of one of the learned and liberal professions.

ARTICLE II.

Section 1. Every candidate for membership in the Colorado State Medical Society shall make a written application to the committee on admission, and such application shall be accompanied by a diploma or certificate vouching for possession of the same from some regular medical college, the requirements of which conformed to those for membership in the American Medical Association at the time the diploma was issued, and his reputation shall be vouched for, in writing, by at least two members of the society.

Sec. 2. If this committee shall report favorably thereon to the society, the candidate shall be balloted for, and the approving votes of three-fourths of the members present shall be necessary to his admission.

ARTICLE III.

No individual who shall be under sentence of expulsion or suspension from any state or local medical society of which he may have been a member, or whose name shall have been, for non-payment of dues, dropped from the rolls of the same, shall

be received as a member of this society, or be allowed any of the privileges of a member, until he shall have been relieved from the said sentence or disability by such society, or shall have paid up all arrears of membership; nor shall any person, not a member and supporter of a local medical society, where such a one exists, be eligible to membership in the State Medical Society of Colorado.

ARTICLE IV.

Honorary membership may be conferred by a vote of two-thirds of the members present at any regular meeting of the society, upon worthy and distinguished medical gentlemen.

ARTICLE V.

INITIATION FEE.

All the members of the society (honorary excepted) shall, at the time of their admission, sign the constitution and pay an initiation fee of $5, nor shall membership be consummated until the provisions of this article are complied with.

ARTICLE VI.

ASSESSMENTS.

All members shall pay such annual assessments as may be made from time to time by the society. Said assessments to fall due at the annual meeting when made.

ARTICLE VII.

OFFICERS.

The officers of this society shall be a president, three vice presidents, designated and elected specially as first, second and third vice presidents; a corresponding secretary, a recording secretary, a treasurer and a standing committee on admission of members, all of whom shall be elected annually by ballot, and by a majority vote, at the regular meeting, to serve until their successors are duly elected and qualified.

ARTICLE VIII.

BOARD OF TRUSTEES.

The members of this society shall also, at each annual meeting, elect a board of trustees, consisting of seven members

—of which board the officers-elect of this society may constitute a part—in whom shall be vested the government of the society and the management of its business. The board shall be authorized to elect their own officers, and shall serve until their successors are duly elected and qualified.

ARTICLE IX.

COMMITTEES.

The following standing committees shall be annually appointed by the president: First, an executive committee; second, a committee on finance; third, on publication; fourth, on medical ethics; fifth, on medical societies; sixth, on necrology; seventh, on legislation; eighth, on by-laws.

ARTICLE X.

DUTIES OF OFFICERS.

It shall be the duty of the president to preside at all regular meetings of the society, enforce a due observance of the constitution and by-laws, see that all members of committees and officers perform their respective duties, appoint all committees not otherwise provided for, give the casting vote only, sign diplomas and all other official documents requiring his signature and perform such duties as pertain to his office by usage and custom.

ARTICLE XI.

The vice presidents shall assist the president in the performance of his duties, and in his absence shall preside in order of their rank.

ARTICLE XII.

Section 1. The corresponding secretary shall conduct the correspondence of the society, notify the chairmen of committees of their appointments, and request them to answer in writing whether or not they accept; give due notice of annual meetings, sign diplomas, and certify to all official acts requiring the same; receive the signature and initiation fees of all duly elected members and the annual dues of all members, transferring all moneys so received to the treasurer; have the charge of all books, manu-

scripts, instruments, preparations and other scientific property belonging to the society, and shall keep a catalogue of the same, and report on the condition of the same at the annual meeting. The corresponding secretary will receive, as compensation for the faithful discharge of his duties, the sum of one hundred dollars ($100) per annum.

Sec. 2. The recording secretary shall keep correct minutes of the proceedings of the society, and make a full report of the discussions on all papers, take charge of the minute books and other documents and papers read before the society immediately at the close of each session, and keep them during the intervals, subject to the inspection of any member desirous of so doing. If necessary, in order to give a full and correct report of all proceedings and discussions, he shall, at his own expense, furnish a stenographer during the sessions of the society. The recording secretary shall receive, as compensation for the faithful discharge of his duties, the sum of fifty dollars ($50) per annum.

ARTICLE XIII.

The treasurer shall receive all moneys due to the society, and pay all bills endorsed by the finance committee and countersigned by the president, keeping correct accounts of the same and making a full and detailed report at the annual meeting.

ARTICLE XIV.

Any member who shall fail to pay his dues for a period of three years shall be dropped from the roll of membership, and so notified by the secretary.

ARTICLE XV.

DUTIES OF COMMITTEES.

Standing committees shall keep regular minutes of their proceedings, and furnish an authentic copy to the secretary, and make a written report at the annual meeting.

ARTICLE XVI.

It shall be the duty of the committee on admissions, upon receiving the names of candidates for membership, to make inquiry and report such as may be found worthy to the society,

which may thereupon elect him. Should the committee fail to report upon such nominations submitted to them, any members having made such nominations may renew the same directly to the society, in which case a vote of four-fifths of the members present shall be requisite to constitute an election.

ARTICLE XVII.

The executive committee shall digest and prepare the business of each meeting, provide suitable rooms for the purpose of the society, recommend plans for the promotion of its objects, and in all things protect and look after the general interests of the society.

ARTICLE XVIII.

The committee on finance shall superintend the monetary affairs of the society, inspect and audit all bills and accounts of the treasurer, and make such an assessment, by a *pro rata* tax upon the resident members, as may be necessary for the incidental expenses, subject, however, to the approval of the society.

ARTICLE XIX.

The committee on publication shall superintend the printing of such papers, with the full discussion thereon, as may be ordered to be published, so that they may be issued on uniform paper. The publication of the Transactions shall not be permitted until final revision of proof and its adoption, with permission to print, signed by a majority of the committee on publication, and under the title "Transactions."

ARTICLE XX.

The committee on ethics shall hear all complaints of any breach of etiquette or violation of medical ethics. It shall decide all questions of ethics submitted to it. If any member shall be charged in writing by any other member of the society with any violation of the provisions of the by-laws, or with unprofessional conduct, a copy of such charge shall be furnished him; himself and his accuser cited to appear; when the committee shall proceed to hear the case, reserving its decision to be

reported to the society, when its action may be affirmed by a vote of two-thirds of the members present.

ARTICLE XXI.

The committee on medical societies shall consider and report on the organization of such medical societies as desire to become auxiliary to the State Medical Society, and generally take charge of this department, making at each annual meeting as complete a report as practicable.

ARTICLE XXII.

The committee on necrology shall report the death of any member of the society, with a brief biography, and this report shall be published in the Transactions.

ARTICLE XXIII.

The committee on legislation shall report to the society any matter concerning its welfare which requires state legislation, and see that the same is properly presented to the legislature for action, if so instructed by the society.

ARTICLE XXIV.

The committee on by-laws shall report to the society any needed change in its by-laws.

ARTICLE XXV.

DISCIPLINE.

A member may be expelled, suspended or reprimanded by a vote of two-thirds of the members present at any annual meeting, which vote shall be had in consequence of a report from the committee on ethics, and which may be confirmed by a majority of the board of trustees.

ARTICLE XXVI.

Any member wishing to withdraw from the society shall be permitted to do so on his written request, after he shall have presented the treasurer's receipt for all moneys due.

ARTICLE XXVII.

The regular meeting shall be held annually, and shall commence on the third Tuesday of June. The place of meeting shall be determined by a committee of five appointed by the society, and a banquet shall be given on the evening of the last day, as arranged for by the executive committee.

ARTICLE XXVIII.

Special meetings shall be called at any time by the board of trustees.

ARTICLE XXIX.

At all meetings the presence of nine resident members shall be necessary to constitute a quorum.

ARTICLE XXX.

The order of proceedings shall be as follows:

1. Opening of meeting by prayer.
2. Reading of minutes by the secretary.
3. Annual address by retiring president.
4. Annual reports of officers and standing committees.
5. Election of officers.
6. Annual and special committees' reports.
7. Voluntary papers, contributions, reports.
8. Annual assessment shall be laid by resolution.
9. Miscellaneous business.
10. President-elect shall assume the chair and announce committees for succeeding year.

ARTICLE XXXI.

These by-laws may be repealed, annulled, altered or amended at a regular meeting, on the recommendation of two-thirds of the members present.

LIST OF THE PRESIDENTS OF THE SOCIETY FROM ITS ORGANIZATION.

1871—*R. G. Buckingham, M. D.....Denver
1872— W. F. McClelland, M. D.....Denver
1873—*G. S. McMurtrie, M. D.....Central
1874—*H. K. Steele, M. D.....Denver
1875—*W. H. Thacker, M. D.....Denver
1875— H. O. Dodge, M. D.....Boulder
1876—*W. H. Williams, M. D.....Denver
1877— T. G. Horn, M. D.....Colorado Springs
1878— A. Stedman, M. D.....Denver
1879— B. P. Anderson, M. D.....Colorado Springs
1880— F. J. Bancroft, M. D.....Denver
1881— H. A. Lemen, M. D.....Denver
1882— P. R. Thombs, M. D.....Pueblo
1883— W. R. Whitehead, M. D.....Denver
1884— Jesse Hawes, M. D.....Greeley
1885—*J. C. Davis, M. D.....Denver
1886— J. W. Graham, M. D.....Denver
1887— S. E. Solly, M. D.....Colorado Springs
1888— S. A. Fisk, M. D.....Denver
1889— J. W. Collins, M. D.....Grand Junction
1890— J. T. Eskridge, M. D.....Denver
1891— W. M. Strickler, M. D.....Colorado Springs
1892— W. E. Wilson, M. D.....Denver
1893— E. J. A. Rogers, M. D.....Denver
1894— Hubert Work, M. D.....Pueblo
1895— I. B. Perkins, M. D.....Denver
1896— Robert Levy, M. D.....Denver
1897— L. E. Lemen, M. D.....Denver
1898— W. A. Campbell, M. D.....Colorado Springs
1899— J. N. Hall, M. D.....Denver

*Deceased.

A LIST OF THE READERS OF PAPERS OF THE SESSION OF 1899.

Axtell, E. R.
Arbogast, B. A.
Babcock, R. H.
Bane, W. C.
Beggs, W. N.
Bergtold, W. H.
Black, G. M.
Blaine, J. M.
Burns, T. M.
Cline, J. W.
Corwin, R. W.
Denison, Chas.
Edson, C. E.
Eskridge, J. T.
Finney, F.
Foster, J. M.
Freeman, L.
Hall, J. N.
Hawes, J.
Hershey, E. P.
Hopkins, S. D.
Jackson, E.
Jayne, W. A.
Kahn, Sol G.
LeMond, R. F.
Macalester, R. K.
McNeelan, M.
McHugh, P. J.
Melvin, J. T.
Miel, G. W.
Packard, G. B.
Parkhill, C.
Perkins, I. B.
Pershing, H. T.
Powers, C. A.
Roberts, John B.
Rogers, E. J. A.
Rothwell, P. D.
Rothwell, W. J.
Solly, S. E.
Spivak, C. D.
Stevens, E. W.
Stuver, E.
Taylor, T. E.
Tyler, G. E.
Warren, H. E.
Wetherill, H. G.
Whitney, H. B.

A LIST OF THOSE WHO TOOK PART IN THE DISCUSSIONS OF THE SOCIETY'S PAPERS, SESSION 1899.

Arbogast, B. A.
Axtell, E. R.
Bane, W. C.
Black, G. M.
Blaine, J. M.
Burns, T. M.
Corwin, R. W.
Denison, Chas.
Edson, C. E.
Espey, J. R.
Eskridge, J. T.
Finney, F.
Freeman, L.
Grant, W. W.
Hall, J. N.
Harrison, M.
Hawes, J.
Hawk, J. W.
Hill, E. C.
Jackson, E.
Kahn, Sol G.
LeMond, R. F.
Little, W. T.
Love, Minnie C. T.
Marks, A. D.
Melvin, J. T.
Munn, W. P.
Perkins, I. B.
Powers, C. A.
Roberts, John B.
Rogers, E. J. A.
Rothwell, W. J.
Solly, S. E.
Stuver, E.
Taylor, T. E.
Van Zant, C. B.
Warren, H. E.
Wetherill, H. G.
Whitney, H. B.
Wilson, W. E.

NOTE.

By resolution, adopted during the session of 1872, the Colorado State Medical Society does not hold itself responsible for the doctrines or statements contained in any paper published in the "Transactions."

H. B. WHITNEY, M. D.,
Chairman Publication Committee.

PRESIDENT'S ADDRESS.

Ladies and Gentlemen: The work of this meeting of the society reflects credit upon the profession of the state of Colorado. It shows a united profession throughout the state. The papers have been many, and their quality excellent. Various subjects have been discussed in an able and scientific manner. We have been favored by the presence and words of wisdom and experience of two of our eastern confreres, for which we are truly grateful.

The success of the year's work in Colorado, and the completeness of this meeting, is due to the faithful working of the committees of this society. Our executive committee has been indefatigable in its labors to make this meeting of the society a success. The meeting itself speaks well for their efforts.

Our legislative committee has been a very active one. They worked hard to draft a suitable bill governing the practice of medicine and surgery in Colorado. They called on the homeopathic and eclectic schools to join them in their efforts to get the bill through the legislature. They succeeded in having the bill carried forward on the calendar, and it passed both branches of the legislature and would now be a law but for the veto of the governor.

In support of my committee on legislation, I deem it my duty and privilege to review the message. The veto message contained 4,500 words and is of a queer make-up. In many ways it contradicts its own statements. Why could not the governor have been as terse in his veto of this bill as he was in his signing of the prize fight bill? Why could he not give all animal creation the same protection? The life of the horse is not endangered when his tail is docked, but the life of man is when many whom the governor would license to practice medicine are called in to treat him.

Let us, for a few minutes, review some of the reasons given for the veto. The governor shows considerable sarcasm and irony when he commences and recites the bill and the contentions between the schools that have taken part in the framing of the same. He is frank and honest when he says a large majority of the profession of the state have asked him to sign the bill. He excuses his action by saying that they are interested parties; that they are forming a trust and seek to further their own interests by advocating the bill, rather than to protect the health of the community. We would ask the gentleman to look into the work of those most prominent in the advancement of the bill and see if they are wanting in business by the existence of the quackery they seek to eradicate. We are glad to say that we believe their motives are higher, and all the anathemas the governor may heap upon them will not change our minds in the least.

He compares the death rate of Colorado with that of states having similar laws to this bill. He does not stop to consider many things that go to make up vital statistics, but seeks to exonerate his action by conveying a wrong impression to the common people, just as he has been telling the women leagues of the state that if he calls an extra session of the legislature, the repeal of the prize fight bill will be considered. He knows full well no extra session will be called, hence he can make the promise.

He says: "Nearly every advance in treatment of disease, in the method of their detection, and in the prevention of their occurrence, has been made by physicians in disregard of the regulations of the order; and the great body of their brethren, after denouncing and enduring, have ultimately accepted the unquestionable results of those researches and discoveries, and made them respectable by adding them to the category of the recognized and the regular." * * * "This is but to say that medical progress in general has not been made by, but notwithstanding, the great body of its professors."

It is easy to denounce and make assertions like the above, but when asked to furnish proof of the statements, it is wanting. Would his excellency go with us to the archives of history for a short time and look into the subject of medicine. Examine well

into the history of smallpox, diphtheria, typhus fever, yellow fever, cholera, and the plague, and tell us through what source these diseases have been almost eradicated or very much limited in their destructive course. Even tuberculosis and typhoid fever are losing some of their terrors. Look into the subject of anæsthesia and antisepsis, and tell us from whence came these pain-relieving and life-saving discoveries. They did not come by chance, but by scientific research. We would ask him to cite us to a true, legitimate advance made in medicine or surgery by the class he seeks to protect by the veto of this bill. Has the charlatan ever been known to make a discovery that has proved beneficial to mankind?

He admits the existence of the charlatan and the reckless administration of remedies by this class of individuals. He also speaks of their taking advantage of the afflicted by robbing them of health and substance; and then goes on to say that bad men abound in all professions. If all persons demanding medical and surgical aid were of responsible age and condition, his argument might be tenable and show good logic. We would ask his honor why laws have been enacted protecting minor heirs, irresponsible persons and those debilitated by disease. Why not let those interested (?) in their welfare do as they please with them and their possessions? The state has seen fit to protect them, and we believe the health of these same minors and irresponsible persons is a possession deserving protection by the state. We would say, "Thou shalt not" employ this man to tamper with the health—a possession—of the the minor, just as the state now says thou shalt not sell or dispose of the possessions of the minor unless we so direct.

But why multiply words in considering further the veto message? We might ask why his excellency entered so fully into this matter? It can all be summed up in three words—for political reasons. These political reasons are apparent to all present. We will trust to the good common sense of the medical profession of Colorado the fate of this gentleman, should he ever offer himself for political favors again.

It is fitting, at this meeting, the last one in the nineteenth century, that we review the advance made in our profession

during the century. It is well, at times, for us to take a retrospective view of events and consider the progress that has been made in a given line of work. In this way we may be better able to foretell what will be the reward of effort in the future. Our review will necessarily be a brief one, as the field is extensive. We will limit our review to medicine and surgery in the United States.

In the beginning of the century medicine in the United States was in rather a chaotic state. One can not at the present day, with all of our modern means of disseminating knowledge, form an adequate conception of the then existing state of medicine. There were then, as now, true, willing, conscientious and courageous men making application of the then existing knowledge of medicine to the ills of their fellow-men. With the light of the closing of the century we feel they labored under untold disadvantages. The interchange of medical ideas was slow. Instead of reading to-day of what was done in Europe yesterday, it took months to get the knowledge. There was but one medical journal published in the United States. Now we have 250 publications. Then there were three medical colleges, with about 100 in attendance. Now we have innumerable colleges, with more than 20,000 in attendance. Then there were but a few American medical works; now there are 300 books and pamphlets published annually by American authors, besides 5,000 journal articles. We have on our shelves over 7,000 books by American authors.

Then the medical schools had four professors—one on theory and practice of medicine, one on anatomy and surgery, one on botany and materia medica, and one on chemistry. Now it takes several pages of an annual announcement to give the names of the professors and adjuncts of a modern medical college. The college term was short, and the years required for graduation were but two.

Compare, if you please, the equipment of a modern college with her varied laboratories for research, with the college of 1800, where nothing but didactic lectures on anatomy, surgery, medicine, botany, materia medica and chemistry were heard. When we do this we marvel at the work accomplished by such men as Rush, Physick, Rodgers, Gerhardt, McDowell and others.

Anatomy has always been considered the groundwork for a medical education. It was taught only macroscopically in the early portion of the century. Nothing was known of the modern methods of preserving the bodies and specimens. Dissecting rooms were full of stench almost unbearable, and frozen sections were unknown. Stainings were undiscovered, and the microscope unused in this study. Anatomy at this time was considered thoroughly understood and future research unnecessary. We think differently when we consider what has been revealed in the study of histological anatomy, and the researches in the direction of comparative anatomy. We are thankful, when we have before us the modern anatomical works, with their fine colored plates, that we live at the close of the nineteenth century and have been privileged to use the works of Allen, Minot, Heitzman and McClellan in getting our anatomical knowledge, and now have them for consultation.

Physiology, always closely allied with anatomy, was not taught as a separate branch until well into the latter half of the century. A knowledge of the science has existed since the study of medicine began, but it was always taught in connection with some other branch. Priestly, Beaumont, Brown-Sequard and Draper made some very interesting discoveries and did much toward bringing the study before the profession. To-day it is a very important study, and many laboratories are doing good work, notably those at Harvard and Johns-Hopkins University. As a more intimate anatomical knowledge has developed, so has there been a stimulation in the field of physiology. Many phenomena that were formerly thought to be due to the supernatural are now accounted for by physiological action.

Very great advancement has been made in materia medica and therapeutics. From the crude drugs in the beginning of the century by evolution have come the palatable forms of medicine of the present day. Many of the crude drugs have yielded up their alkaloids, their resins, or their extracts, and we to-day give in minute pill or tablet a definite dose. The administration of drugs hypodermically was not in general use until the beginning of the last quarter of the century. We may not have led all other countries in the discovery of the active principles of drugs and new remedies, but we have been in the advance in their manufac-

ture and practical application. In our busy every-day rounds and administration of remedies we lose sight of the fact that we are possessed with many remedies unknown to the doctors of a century ago. Bromide of potassa was first known in 1853. Chloroform was first used in 1846; chloral in 1869; salicylic acid in 1875. Add to these iodoform, nitro-glycerine, salol, phenacetine, cocaine, hyoscin and many others our manufacturing chemists are daily thrusting upon us, and we have an array of remedies that would have made Rush think the millennium was at hand had they been presented to him in his day. Further, we have at the close of the century "organotherapy." We use, and that successfully, thyroid extract in myxedema and cretinism; suprarenal extract in Addison's disease; serum therapy and antitoxins in diphtheria, tetanus, puerperal and other sepses and tuberculosis.

The advance in medicine during the century has been phenomenal. Knowledge in this branch was altogether empirical in the beginning, but now we administer all our remedies on a scientific basis. The etiology of a disease was made up from the symptoms, and not from scientific investigation, as at the present time. They did not employ the microscope as an aid in detecting diseases. The stethoscope, phonendoscope, fluoroscope, centrifuge and all the present armamentarium of the diagnostician were unknown. The research into the causes and prevention of disease has been unintermittent and crowned with many important discoveries.

When we consider the steady advance medicine has made from the beginning of the century to the present time, we can but draw the deduction that we are not what we are by our own efforts, but by the aid of all medical men who have gone before. Our advanced position in medicine is due to the indefatigable efforts of such men as Rush, Gerhardt, Bartlett, Drake, Bigelow, Bowditch, Woodward, Flint, DaCosta and many others, both dead and living.

What has been said of medicine in the beginning of the century can also be said of surgery. American surgeons were unknown to the world by any of their achievements prior to the nineteenth century. But they were not long to be kept in oblivion. We have the century opening with such men as Physick,

McDowell, Mott, Clark and others. In the second third of the century we see the work of the elder Gross beginning to loom up. And we challenge the world to show us a man that has done more for surgery than our greatest of American surgeons, Samuel D. Gross. The surgeons of the latter half of the century are not excelled by any other country in the world. They are legion, and we refrain from mentioning any in particular.

With the discovery of anæsthesia, and later that of asepsis, new fields were thrown open to the surgeon. With the aid of modern methods and instruments we marvel not so much at the result attained, as we do that the surgeon of the first half of the century got any results at all. The Roentgen rays can not locate a foreign substance in the body in so remote a position that the surgeon's aseptic knife can not remove it, and that without pain. The benefits of asepsis in wounds have never found a better illustration than in our Hispano-American war just ended. Here the mortality was less than in any previous war, and that under very unfavorable climatic conditions.

Closely allied with general surgery is that of gynecological and obstetrical surgery. Asepsis has been a boon to woman. Many of the diseases peculiar to her sex that were considered fatal at the beginning of the century are now operated upon successfully with scarcely any mortality. The pains of labor have been alleviated by anæsthesia and chloral, and the unavoidable injuries repaired under antiseptic precautions without fatalities. To American genius and skill women owe all these advances. In these branches the names of McDowell, Sims, Emmet and Battey stand out in bold relief.

We will refrain from reviewing the good work done by the subdivisions of medicine and surgery. Suffice it to say that wonderful strides are being made in all branches. We do not hesitate to say that medicine is as truly a science to-day as any of her sister studies and rests on as firm a basis as any of them.

Wonderful has been the progress in this science during the past century. As we stand on the threshold of a new century and see the old one recede from us, we hesitate, and ask ourselves Can there be as much in store for the future as there has been in the past? The developments of the past few years would lead

us to believe that we are just in our infancy and there will be still greater progress in the future.

As we look down through the dim dawn of the century we see many of our infants growing strong with the developments of time. We see others that we hoped much for dwindle away and die from misuse. Other conceptions give birth to new ideas and methods, and we wonder why we were so thick-headed as not to have thought of these things ourselves.

Electricity is one of our infants that we expect to see grow stronger in the light of the next century. It is one of the potential forces of the universe, and we may expect great things from it in the future. We see the day coming when its true therapeutical uses will be more thoroughly understood and the physician will have his battery for use and not for show. Roentgen rays have been but partially developed, and we see the physician of the future looking with precision at the various organs of the body, whereas he now looks with a clouded vision.

The pharmacists will still vie with each other in giving us new remedies and perfecting our old ones. We see the future physician more careful in the selecting of his medicines than we are at the present day.

Organotherapy will be thoroughly looked into, and if not proven to be what its advocates declare it to be it will be relegated to the grave of oblivion, and will only be remembered as one of the remedies of the ignorant doctor of the close of the nineteenth century.

Serum therapy and antitoxins will grow in strength as time advances and knowledge in this line accumulates. We will be able by these means, in the future, to cure and prevent many of our most deadly diseases of the present day. Tuberculosis will have lost many of its terrors and will be counted as one of the most easily cured diseases. Cancer will yield to treatment. Yellow fever will be stamped out and many of our diseases eradicated.

Liquid air will be used in various ways, and we will go into deadly places not fearing impure air, for we can take some along with us bottled up in our pockets.

As it has been proven quite recently that the stomach may be removed and the patient continue to live, what are we to expect from the surgery of the twentieth century? We may look for other vital organs to be removed and provision made to sustain the system without them.

More interest will be taken in sanitary measures and the prevention of disease. Quackery will be controlled by legislative enactments.

Truly great things may be looked for in the twentieth century. When we contemplate all these things, we feel that there is a satisfaction in the thought of having lived and taken a part in promoting the interests of a science having for its object the preservation of the human race and the alleviation of pain and suffering.

ADDRESS IN MEDICINE.

ARTERIO-SCLEROSIS, WITH SPECIAL REFERENCE TO ITS EFFECTS ON THE HEART, AND TO TREATMENT.

BY ROBERT H. BABCOCK, M. D., CHICAGO, ILL.

Few of us can resist temptation when it is artfully presented. To be irresistible the temptation must consist of some allurement that falls in with desire. It was exactly this combination that has brought me to Denver at this time. The chairman of your committee on arrangements, Dr. Powers, and his ambassador, Dr. Bonney, knew how to perform the part of tempter by presenting the allurements, while I played the role of victim by furnishing the desire to again breathe your exhilarating Colorado air and come in touch with your warm Colorado hearts. I should not say I was the victim of temptation in this instance; I was rather the favored recipient of temptation. And yet, as is usual when one has yielded to persuasion, my heart has quaked with apprehension. This dread did not concern the warmth of your welcome, for of that no visitor to your state need entertain any doubt, but it arose from my distrust of my ability to select and afterwards present a topic that would interest you. In the first place, unfortunately, most practitioners nowadays seem more attracted by surgical than medical matters. In the next place my sphere of work is limited, and I feared lest I might choose a topic that would impress you as hacknied or but the threshing over of dry straw. As it is, I am painfully conscious that I can not present anything original or perhaps unknown to you. But I have decided on my subject as announced because of its vital importance to us as individuals as well as physicians.

A glance over current medical literature of England and the Continent will at any time disclose contributions of one kind and another all bearing directly or remotely on this subject. Although in our country many valuable papers have appeared on arterio-sclerosis, still I do not think practitioners here give it as much attention as it receives abroad and as it deserves. How this may be in Colorado I do not know, but certain etiological considerations, so far as these are understood, would lead me to infer a great relative frequency of the disease here and hence its corresponding importance.

It is not my intention to dwell upon its history further than to say that degenerative changes in the blood vessels have attracted attention from the very beginning of pathological anatomy, and for the most part were described as ossification or calcification of the arteries. It remained for Lobstein in this century to devise the generic name of arterio-sclerosis. Virchow bestowed the term of endarteritis deformans and nodosa, while Friedländer described, as endarteritis obliterans, syphilitic degeneration of the cerebral arteries. In England the earliest and most noteworthy contribution was that of Gull and Sutton on arterio-capillary fibrosis.

The most noteworthy contribution perhaps to this subject, of recent years, was that of Thoma in Germany, while in this country should be mentioned papers by Peabody and Councilman, read before the Association of American Physicians in 1891. According to the last named, three varieties are to be distinguished—the nodose, the senile and the chronic diffuse arterio-sclerosis, with the last of which this address will deal.

As you know, the etiology of this disease is still obscure. The almost unexceptional discovery in the old of degenerative changes in the aorta and its great branches seems to have established the causative influence of advanced age, and hence the distinction of the senile form. It may be stated also in passing that this division appears warranted by the fact that when this form exists alone, the heart is very likely to be found atrophic instead of hypertrophied. As regards the diffuse form, syphilis is clearly recognized as of pronounced etiological influence. It would be a mistake, however, to consider all cases due

to specific infection, and therefore one must look for other causes. Among these are heredity, race, sex, gout or the gouty diathesis, rheumatism, chronic Bright's disease, the habitual consumption of an excess of food and alcohol, and strain. Most writers are agreed in ascribing more or less influence to inheritance, since some families manifest a striking tendency to early and pronounced arterial degeneration. It is assumed that in such the natural "rubber," as Osler puts it, that is the elastic material entering into the make-up of the vascular coats, is of poor quality, and the arterial walls readily succumb to influences that would not seriously affect healthy vessels. Osler, who encounters a relatively large proportion of negroes among the patients of Johns Hopkins Hospital, thinks race may be of some importance, since this disease comes on early and to a marked degree in colored people. While not at all disposed to deny the potency of these two factors, heredity and race, I confess I query how much influence is attributable to them and how much to a strong gouty taint in such families and races. In the instances that have come under my observation, and that have appeared to illustrate inherited or race predisposition, they have always shown what we are wont to consider irregular manifestations of gout. Sex seems responsible only in so far as males are more exposed to those conditions of occupation and habits which are themselves etiological factors. English authors, who see much of gout in its typical and obscure manifestations, attribute no small importance to this in the causation of arterio-sclerosis. Fothergill had much to say on this subject and described gouty Yorkshire squires who reached and enjoyed an active old age, despite the pipelike rigidity of their arteries. Just how gout acts to bring about this vascular change is not quite clear, but probably through irritation or nutritive disturbance of the muscular coat. Rheumatism is a doubtful factor, while renal changes are so intimately associated, both as cause and effect, with degeneration in the arteries that both can be passed by in this place. An habitually excessive food supply, or "luxus consumption," as the Germans call it, has long been recognized as a factor in the causation of prolonged high arterial tension and therefore of arterial stiffening. By

an excess of food consumption is meant an excess in either quantity or quality above the needs of the system or the individual's ability to utilize it by reason of his physical inactivity. Fraenkel has pointed out that arterio-sclerosis of this origin is generally found in corpulent individuals who feed well and lead a sedentary existence. Clergymen, lawyers, railroad officials, men of large affairs, and those generally who habitually use their brains too much and their muscles too little, furnish abundant illustrations. Fraentzel attributed the secondary vascular and cardiac changes in such persons to habitually increased blood pressure. They are more likely secondary, as explained by Hasenfeld, to sclerosis of the great abdominal arteries. Concerning alcohol, it is only necessary to remark that, whereas some diversity exists in regard to its daily moderate use, opinion seems united in ascribing to its habitual abuse distinct influence in bringing about vascular degeneration.

Lastly, by arterial strain as an etiological factor is meant either functional strain or that due to habitually severe muscular labor. The influence of functional strain is well shown by the degeneration of the aorta and other large arteries in cases of free aortic regurgitation, and by animal experimentation. Thoma believes it to be the explanation of local arterio-sclerosis in some special organ. In Scotland physicians have ample opportunity of observing the effects of whisky and arduous toil on the circulatory apparatus, and Gibson makes the very positive statement that laborious occupations are largely concerned in the causation of degenerative changes in the blood vessels. It has occurred to me, therefore, that if the last two factors have etiological connection with the disease under discussion, then Colorado physicians ought to be specially interested in this subject and should be in position to contribute materially to information on the matter. Prospectors, and other men engaged in mining in one capacity or another, whose labor necessitates arduous mountain climbing, whose lives are made up of unremitting bodily and mental strain and who perhaps imbibe too much whisky, should theoretically furnish marked examples of arterio-sclerosis. Nevertheless, it may be queried whether other injurious agencies do not have to be added to muscular

strain to make this harmful. The stiffened arteries, and particularly the visceral changes secondary thereto, will be most likely to show themselves not during the years of physical hardship so much as when, having filled his barns with stores of worldly wealth, Dives says to his soul, "Now take thine ease, and enjoy the good things I have secured for thee." Then will be added the baneful effects of luxurious living, and then, unfortunately, in most cases it is too late, for the mischief has been done.

Most of us are familiar with the post mortem appearances of arterial degeneration as found in the aorta and larger blood vessels, and to give a detailed description of them would be a work of supererogation. It will serve therefore to remind you of only a few practical points. The first and lasting effect of sclerosis is the impairment of the elasticity of the vessel. Its coats may be thickened and its lumen diminished. In other cases, the aorta for example, the vessel is thin-walled and dilated. I have known such a dilatation to extend throughout the entire arch of the aorta. The sclerotic process sometimes involves the aortic valves and even the posterior segment of the mitral valve, causing more or less loss of their integrity. Atheromatous placques and ulcers may exist, and the latter not infrequently give rise to dissecting or sacculated aneurisms. White or gray calcarious plates are seen, quite generally distributed over the surface of the intima or only in scattered areas, and now and then one of these thin, hard scales is turned up on edge so as to have vibrated in the blood stream, or sometimes such a minute plate becomes detached and swept off into a distant part as an embolus. This degenerative process may invade any portion of the vascular system, but, according to Sach, affects the various arteries in the following order of frequency: tibialis anticus, ulnar, radial, popliteal, femoral, ascending aorta, common carotid, external iliac, abdominal aorta, brachial. It also so frequently invades the arteries of the abdominal viscera that, according to Hasenfeld, fibrous thickening of their intima may be almost considered physiological. He finds sclerosis specially pronounced in the splenic, hepatic and superior mesenteric arteries, either alone or associated with the same changes in the

renal vessels. A not at all infrequent post mortem finding is more or less coronary sclerosis, the extent and results of which we shall consider later on.

Thoma is of the opinion that the initial change is a degeneration of the media, in consequence of which its muscular fibres become transformed into a homogeneous hyaline mass and even its elastic layers break up and disappear. This weakening of the middle coat causes dilatation of the artery, which then becomes compensated by a growth of fibrous tissue in the intima. Atheromatous degeneration of the thickened inner coat may subsequently take place. According to Thoma, about a year elapses before the thinning and weakening of the media is offset by fibrous increase of the intima; and therefore this is a period of danger because of the liability of the vessel wall to give way under strain and thus lead to formation of aneurism. This period of danger is thought to extend from about the thirty-fifth to the forty-fifth year; if this is correct, it has a very practical bearing.

The effects of arterio-sclerosis on the various organs and tissues embrace not only functional disturbance of greater or less importance, but also serious alterations of structure. We are wont to recognize chiefly those of the kidneys, brain and heart. Yet they are by no means confined to these organs. In this address attention will be directed to the heart.

In chronic diffuse arterio-sclerosis this organ is generally enlarged, its increased size consisting of combined hypertrophy and dilatation. When the hypertrophy is most marked in or limited to the left ventricle, it is the thoracic aorta, according to Hasenfeld, or the arteries of the abdominal viscera, which are chiefly diseased. The heart is uniformly enlarged, according to the same author, when the sclerosis invades chiefly the kidneys, or these organs together with the vessels supplied by the splanchnic nerves.

The cause of the cardiac hypertrophy is generally ascribed to increased work put upon the myocardium to successfully meet the augmented peripheral resistance due to heightened blood pressure. Hypertrophy is the first effect, and is the chief one so long as the heart muscle is competent.

So soon, however, as the myocardium begins to lack sufficient nutrition, it commences to yield, slowly or rapidly as the case may be, and dilatation of the cardiac cavities is added to hypertrophy.

Setting aside blood changes and toxic agencies, the nutrition of the heart is injuriously affected by whatever interferes with the blood supply to the heart. In arterio-sclerosis we have a condition exactly calculated to do this. Atheromatous occlusion, complete or partial, of the mouths of the coronaries may take place; or the sclerotic process may invade these arteries themselves, causing thickening and narrowing, or thinning and dilatation. Whatever may be the exact nature of the coronary changes, blood flow in these vessels is hindered and thrombosis is favored. The myocardium is thus slowly or quickly starved to death, and the appearances vary in accordance with the degree and rapidity of the cardiac ischaemia. If its blood supply is gradually withdrawn through slowly progressing sclerosis, the heart muscle undergoes fibrous degeneration, a condition termed chronic myocarditis and first clearly shown by Huber to depend on interference with the blood supply. When, on the other hand, an area is deprived of blood entirely, this area suffers fatty degeneration or molecular necrosis according to the suddenness of the occlusion of its nutrient artery. These various changes are usually found associated, yet in varying proportions in different specimens.

Such changes, moreover, may affect any of the divisions of the organ, but usually predominate in the myocardium of the left ventricle. According to Huber it is the anterior descending branch of the left coronary artery that is most markedly affected by sclerosis, and hence rupture or aneurism, according to the nature of the antecedent degeneration, takes place most often in the wall of this ventricle, and often towards its apex.

Implication of the valves occurs either through extension of the sclerotic process to the aortic and mitral cusps, previously spoken of, or through such a degree of dilatation in the late stages as to lead to their relative incompetence.

It is obvious, therefore, that the nature and severity of the symptoms will depend upon whether the degeneration involves

chiefly the arteries of the general aortic system or those supplying special organs, as the kidneys and heart.

I shall not discuss the symptomatology in extenso, but will give it what attention is necessary when I consider the treatment.

The existence of chronic diffuse arterio-sclerosis is usually not recognized until the radial arteries have become beady and tortuous, or until troublesome symptoms bring the patient to the physician. It would be better if the diagnosis were made at an early stage, when prophylactic measures might still be of utility and when symptoms might be warded off or delayed. Therefore, after the fortieth year of life, each patient's peripheral arteries, so far as they are accessible, should be carefully studied for evidences of even slight thickening. High and sustained pulse tension is an early sign of disease of the kidneys, the arteries, or both, and hence the degree of tension should be determined by means of the sphygmograph when this can not be done by the physician's finger. Additional evidence of heightened pulse tension and consequently, perhaps, of vascular disease, are accentuation, and particularly a ringing quality of the aortic second sound. In suspected cases the ophthalmoscope is said by Thoma, Rehlmann, Koenig and others to furnish early and important information concerning the state of the vascular system. The changes said to be significant of sclerosis are pulsation and tortuosity of the retinal artery when not due to chlorosis or anæmia, opacity of its coats, narrowing and it may be thrombosis of the artery of the papilla, and according to Koenig miliary aneurisms and punctate hemorrhages into the retina, the choroid, and the enveloping capsule of the optic nerve. It is said also that if atheroma is experimentally produced in dogs through rupture of the aortic valves, thickening and tortuosity of the retinal artery may be discovered after three years or even less. Although these changes in the fundus of the eye are an expression of sclerosis of the internal carotid and not of the general aortic system, still their recognition, even in the absence of palpable thickening of the peripheral arteries, would greatly strengthen the conclusion drawn from the accentuation of the aortic second sound. It should also be remembered that

degeneration is particularly prone to attack the arteries of individuals having a corpulent abdomen and given to sedentary ways. In all such, the heart should be examined with extreme care with a view to determining its size. Unfortunately for the examiner, these patients are apt to have capacious chests and voluminous lungs, which make the accurate determination of the area of relative cardiac dullness a very difficult, if not impossible, matter. If the apex beat can not be felt, and if the borders of the organ can not be made out by simple percussion, or by auscultatory or palpatory percussion, then the question must be settled by inference. Fraentzel has pointed out that in these individuals the left nipple is situated an abnormal distance from the sternum, as much as four and even five inches, and that if the heart can be determined to extend to the left mammillary line, which is generally recognized as the normal boundary on the left side, then it does, as a matter of fact, show enlargement of the left ventricle. In confirmation of his statement, it may be said that Vierordt in his work on physical diagnosis gives three to three and one-half inches as the average limit of cardiac dullness to the left of the median line. Finally, a muffling or lowering of the pitch of the first sound at the apex, and the already mentioned intensification of the aortic second sound, are regarded as indicative of left ventricle hypertrophy.

In the advanced stages, when the radial arteries feel like a string of beads, or the vessel is tortuous and cord-like, or still further on when the arterial changes have led to cardiac incompetence, diagnosis is ordinarily not difficult. There are instances, however, in which the arteries feel soft and the aortic second sound has become enfeebled through dilatation of the left ventricle, or in which the anginal attacks are troublesome and the question of the presence or absence of arterio-sclerosis becomes a very important one. In such, considerable aid may often be derived from palpation of the subclavian arteries. These vessels arch upward in the first third of their course to cross the root of the neck, and can often be felt pulsating half an inch above the middle of the clavicle external to the outer border of the sterno-cleido-mastoid. When the aorta is thin and dilated, or when the subclavian is sclerotic, its natural curve becomes

intensified, so that the vessel lies higher in the neck than normal, and at this point stiffening of its coats can be determined. In some instances I have felt it pulsating and hard fully an inch above the middle of the clavicle. This was first pointed out by Balfour, I believe.

In general, the recognition of the diffuse arterio-sclerosis makes it possible to predicate in a gross way that more or less degeneration of the heart muscle exists. Extent and gravity of the degeneration is to be inferred from the condition of the heart as regards dilatation or hypertrophy, a matter usually not difficult of determination. It is quite another problem, however, to always decide which is the primary condition when chronic nephritis and chronic myocarditis coexist and both organs are inadequate. Theoretic distinctions based chiefly on tension of the pulse and analysis of the urine may be drawn by writers; in practice it is often impossible to make the differentiation.

If the hypertrophy and dilatation affect the whole heart, if the pulse tension is high and sustained out of proportion to the degree of cardiac feebleness and of peripheral arterio-sclerosis, and if the urine is scanty and deficient in solids with or without albumen, the renal disease is probably the primary or predominant one. If, on the other hand, cardiac enlargement is chiefly of the left heart, if the peripheral vessels show marked sclerosis, if the pulse tension is low, if the urine, scanty in amount, is of high specific gravity, with or without albumen, the condition of the heart is more serious and threatening than that of the kidneys.

Lastly, in a given case of cardiac dilatation, with murmurs denoting valvular insufficiency, the presence of marked arterio-sclerosis would strengthen the hypothesis that the incompetence of the valves was secondary to the dilatation which itself was due primarily to the arterial disease.

An essential to the treatment of this affection is the recognition of chronic diffuse arterio-sclerosis as a distinct clinical entity, whose management should be divided into the prophylactic and the therapeutic. Prevention should be addressed first to the arterio-sclerosis as such, and secondly to the results as they affect the heart. Therapeutic measures, so far as they

are possible, should also be directed, first, to the condition of the arteries; second, to the heart when this begins to fail; and, thirdly, to this organ after serious dilatation has supervened.

Unfortunately, the medical attendant is rarely called on to institute prophylactic measures before degeneration of the arteries has made recognizable progress. Some of its causes, as heredity, age, race, sex, we can not remove; but syphilis, gout, rheumatism, excesses in food and alcohol, and vascular strain, can and should be removed or minimized. To accomplish this, the physician must obtain the coöperation of the patient by intelligently explaining the evils of the disease that threatens him and the etiological influence of his habits and mode of life.

Two matters are of prime importance, diet and exercise. These can not be the same for all individuals, and hence each case must be managed according to the peculiarities of that case. As Von Schroetter has wisely said, the same rules do not apply to the office employé and the day laborer. The problem to be solved is the proper adjustment of the metabolic processes. In the case of the laborer more tissue-forming food is required than in that of the man of sedentary pursuits; yet in both repair and waste should be so proportioned through food and exercise as to meet the needs of the system without clogging or over-taxing the excretory organs on the one hand, or starving the tissues on the other. Proper oxidation must be maintained by out-door exercise, and excretion must be kept active through the skin, bowels and kidneys. The degree and kind of exercise will be determined by the state of the heart and vessels. In the stage now being considered regular gymnasium training, bicycling, golf and other outdoor sports now in vogue, horseback riding, rowing, etc., are all admissible. An occasional turkish bath, a sojourn now and then at one of our numerous resorts whose waters are similar to Carlsbad—than which none is better than your Colorado waters at Glenwood and Idaho Springs—these and like measures are all excellent in their way. Massage and Swedish movements are also of service.

As regards diet, very much has been written, and long elaborate lists of suitable foods have been prepared. I can do nothing more at this time than state certain principles.

First—The amount of food consumed must not be excessive, and in quality must not be such as tends to the storing up of superfluous tissue.

Second—The diet must be selected with a view to promoting the best possible digestion, or the lessening of fermentative indigestion when that exists.

Third—Articles rich in lime salts should, so far as possible, be avoided.

Finally, although it may not be scientifically proven that Thoma is right in stating that particular liability to aneurism exists between the thirty-fifth and forty-fifth years of life by reason of the degeneration and weakness of the middle coats of arteries that are beginning at this age to become sclerotic, still it would not be out of place to warn patients at this time against excessive and sudden strain of their vessels. When hyperplasia of the intima has compensated for the weakness of the media, over-strain is no longer injurious to the arteries; it is now more likely to act detrimentally upon the heart. Therefore, the more pronounced the arterial stiffening, the greater must be the precautions against exercise of so violent a character as to tax the heart beyond endurance. Now measures must be taken to protect the cardiac pump itself. I well recall the instance of a man of forty-seven, with very stiff arteries and an enormous heart, who initiated the cardiac break-down by a century run on his wheel to make a record.

With a view to preventing undue cardiac strain some forms of exercise and sports will have to be forbidden, and yet the stringency of such injunctions may be modified according to individual temperament and the degree of self-restraint.

So long as the function of heart, brain or kidneys is not disturbed by an existing arterio-sclerosis, the patient will not complain of symptoms, and there is no indication for the employment of medicines. Not seldom the individual is so active in his habits, and feels so well, that he does not consult a physician from the beginning to the end of the year, and is wholly unaware of the danger threatening him. Even when some trivial ailment carries him to his family doctor, this latter is likely to overlook the stiffness of the vessels, and thus loses an oppor-

tunity to give instruction that might in the end prolong the period of compensation. The only remedy that appears to possess any power over the disease is iodine. This has many ardent supporters in France, where I believe it was first suggested by Huchard. Among its strongest advocates is Germain See, who has reported favorable results from the administration for a term of years of iodide of potassium in daily doses of a drachm. Quite recently Vierordt in Germany has reported equally happy results from the use of iodide of soda. Although authorities are divided on the subject, still the treatment is worthy of trial. Vierordt's method of administration is as follows: The initial dose is a small one, four grains in milk twice a day, so as to establish tolerance of the drug. It is then gradually increased to fifteen grains three times a day. For a week out of each month the iodide is omitted altogether, and after its administration in this manner for a number of months it is discontinued for a longer period than eight days. In this way the remedy is administered for at least a year and a half, or longer if required. Under this treatment the pulse becomes softer, and symptoms in general mitigated even when they do not disappear entirely. French advocates of this medication claim that it causes absorption of the calcarious deposits in the arterial coats.

Rumpf, of Hamburg, who lays much stress on the withdrawal of milk, eggs, rice, spinach and all other food stuffs rich in lime salts, administers to his patients a daily draught composed as follows: Carbonate of soda, 10 gms.; lactic acid q. s. to saturate; add lactic acid 10 gms., simple syrup 10 gms., and distilled water 200 gms. The prolonged administration of this mixture is said to increase the elimination of lime salts by the urine fifty per cent. Rumpf recommends this treatment particularly in cases of angina pectoris, and claims some truly surprising results. It might be urged against this treatment that the solution and removal of the atheromatous plaques would tend to weaken the arterial wall and thus predispose to aneurism. Nevertheless, so severe a symptom as angina pectoris would justify a trial of either this or the iodides.

Chronic diffuse arterio-sclerosis tends to a loss of circulatory equilibrium and consequent congestion of the venous system.

An occasional mercurial purge, therefore, is of service in relieving the portal system and lessening for a time the high pulse tension. Any other medication is not generally indicated so long as cardiac compensation is maintained.

It is quite another thing, however, when the resistance in the vessels has begun to overpower the heart. Measures must now be instituted to reinstate the heart's energy; and, as this can not be accomplished without decreasing its work, such a non-nitrogenous diet and such medical agencies as lessen blood pressure must be prescribed. The medical adviser must maintain close supervision of exercise in whatever form. And in some cases he will have to insist on entire or partial abstinence from all exercise by rest in bed, it may be, until some degree of cardiac strength has been regained. Right here let me register my indorsement of Fraentzel's protest against too rigid and too long enforcement of physical inaction. That author expressed the opinion that because the myocardium is a striated muscle it will be likely to degenerate during repose, the same as any striped voluntary muscle. In this he was wrong, I think, because the heart muscle can never be placed at absolute rest. The heart suffers harm from too rigid rest in these cases because it has to carry on the circulation almost unaided, being deprived of those accessory factors, muscular movements and vigorous respiratory suction. Moreover, the physical rest hinders metabolism, and not only is the myocardium not properly supplied with nutrition, but oxidation and elimination are also restricted; so that the blood flowing through the coronaries is loaded with toxines. Therefore, so long as rest from active exercise is necessary, the patient should inhale oxygen and receive skillful massage.

Another highly beneficial form of exercise for cardiac patients is the so-called "resistance gymnastics," which form a part of the Schott treatment. This method of cardiac therapeutics is receiving very much more attention in Europe than in this country, where it has been largely neglected. I investigated this balniological and gymnastic treatment in 1893 and was the first in the United States to put in to use in private practice, and from nearly six years' experience with it I am able to endorse

the recommendations of European observers. This treatment is particularly adapted to the weak hearts now under consideration when their asthenia has not become too pronounced. English and German medical journals are full of papers on this subject, and hence I will not enter into a description of these exercises. The patient executes certain simple movements of flexion, extension and rotation of the extremities and trunk, and these movements are carefully resisted by the physician or trained attendant. The resistance offered must never be great enough to embarrass the patient's breathing or circulation. If these and other directions are properly followed, the effect on the heart is striking and beneficial. The pulse becomes slower, stronger and fuller, the heart's sounds grow louder and the area of cardiac dullness diminishes, as shown by the position of the apex beat and by percussion.

The exact modus operandi of these exercises is not known; but it has been suggested that it is through dilatation and better filling of the peripheral arterioles brought about by muscular contractions.

Another equally if not more powerful means of restoring these weak hearts is by baths, as first instituted and now carried out at Bad-Nauheim, Germany. These are salt and effervescing baths, the temperature of which ranges between 94 and 86 degrees F., and whose duration is from five minutes for the first to twenty minutes before the course of treatments is over. Ample experience in my hands and others has demonstrated that artificial waters are just as efficient as are the natural ones at Bad-Nauheim. The great advantage in a course of baths there over those at home lies in the fact that the patient is removed from the possibility of business or family cares and can abandon himself to the work of getting well. Properly given, these baths produce analogous effects on the pulse and heart to those of the resistance gymnastics. They are likewise admirably suited to this class of cases. The combined effect of both means is often truly surprising. I would only urge that this plan of treatment be not too long delayed, for in the stage of lost compensation about to be considered it can accomplish very little, if indeed it be not altogether contraindicated.

Finally, as regards other means of preventing entire loss of heart power in this stage, I can only recommend the usual cardiac tonics and stimulants. According to some, digitalis should not be given to patients with stiff arteries without the conjoined use of vaso-dilators to counteract its contracting effect on the arterioles. Strophanthus seems particularly suitable in these cases, therefore. Strychnine in large doses is eminently serviceable and may be administered for a long time with benefit. A rather frequent dose of calomel is also of great utility in diminishing tension and assisting circulation.

Now let us consider the management of the third stage of my division, that in which dilatation has taken place, cardiac asystolism is extreme, and the usual symptoms of this condition are present. The means at our disposal are limited and generally most ineffectual, and, therefore, I shall be brief. Active exercise is now to be forbidden, and the sufferer should have rest and careful massage, with inhalations of oxygen. The diet must be light and simple, largely of milk, and all means must be considered that will allay or prevent flatulent distension of the abdominal viscera. Bowel movements should be kept free, so that the patient may not have to strain at stool.

Strophanthus or digitalin is required, and whatever cardiac tonic is selected, it should be in conjunction with vaso-dilators as the iodides, opium and the nitrites. I consider opium objectionable for several reasons and generally prescribe one of the others. Nitroglycerine is the most frequently administered of all the nitrites. Erythrol tetranitrite is a new compound that is highly praised, because its effects are more lasting, about six hours, and it does not so often affect the head unpleasantly. Nitroglycerine is very efficient, but evanescent, and, therefore, it should be taken every two or three hours. One-hundredth of a grain will dilate the arterioles powerfully without depressing the heart, and therefore this dosè is sufficient as a rule. If cardiac asthma, nocturnal restlessness or insomnia occasion bad nights, a hypodermic of an eighth of morphine with a two-hundredth of atropine is excellent treatment. If cardiac dilatation and stasis become extreme, relief may be afforded by venesection, but is usually only temporary. When dropsy is extreme

and does not yield to the usual diuretics, astonishing results are some times obtained by diuretin; incision or puncture of the ankles may also be done. In this stage I regard the Schott treatment as of but doubtful utility and often of actual harm.

Vigorous treatment may, and often does, bring some improvement for a time. It is generally transient, and upon each recurrence of the symptoms subsequent amelioration is more difficult. At length there comes a time when all treatment is unavailing, and it becomes the physician's plain duty to mitigate suffering and promote euthanasia. This should not be considered necessary, however, until after all means have been tried and proved useless.

Death usually comes through exhaustion, pulmonary œdema, or sudden arrest of the heart in diastole. Mild delirium may precede the end, or the senses be retained to the last.

ADDRESS IN SURGERY.

THE SUCCESS OF OPERATIVE TREATMENT IN FACIAL DISFIGUREMENT.

BY JOHN B. ROBERTS, A. M., M. D., PHILADELPHIA.

The acceptance of an invitation to present a few surgical thoughts to a body like this carries with it a duty to bring forward material either new or at least not too trite. The topic which I have selected is certainly not novel; but it is possible that the members of this society have had their attention directed of late more to operations of greater magnitude and danger, and may therefore find interest in a rather neglected but most interesting field of surgery.

The medical profession in general appreciates what can be done to ameliorate the deformity in harelip and cross eye; but it remains more or less unfamiliar with the resources of surgery in the curing by operation of many other disfiguring lesions of the cheeks, nose, lips, and ears. There is at times a want of perception or appreciation on the part of physicians. For instance, we know to our sorrow that many women with malignant disease of the breast come to the surgeon too late for successful extirpation because the doctor who first saw the growth advised delay, failed to recognize the disease, or was unaware of the frequency of permanent cure of these lesions by early and thorough operation. So in this matter of facial surgery, those afflicted with disfigurements curable by the most trivial operation are often allowed to go through a long life without ever being told by their physicians that relief is obtainable. The patients themselves are ignorant of surgical art; think of an operation as a dangerous and bloody ordeal, associated with the probable complication called by them blood poisoning; and they

therefore cover the chagrin due to their uncomeliness by endeavoring to ignore it. Cyrano de Bergerac has many unfortunate colleagues whose lives might be made happier, as his would have been, by a skillful application of the knife to offending features. A Michael Angelo need not in these days have his artistic sense troubled by a necessary transmission to posterity of a countenance disfigured with a deformed or broken nose, nor need a modern Alexander have a twentieth century Apelles paint only the unmarred side of his face. The dislike of man for conspicuous deformity is known to all, and was utilized by the ancient general who advised his soldiers to strike at their enemies' noses instead of at their hearts.

Plastic surgery is a development of the universal desire to be comely and free from deformity, though the methods used may have been first employed for more utilitarian purposes. In times past mutilation of ears, eyelids, and noses was practiced upon malefactors and other unfortunates as a punishment or badge of servitude. This association of facial disfigurement with the brand of ignominy naturally led to an earnest search for surgical aid to repair the damage or to conceal its results. The attempts of Indian and Italian operators to make new noses, lips, and ears led to a certain degree of interest and success in this branch of operative surgery in the sixteenth century, but little further attention was given it until the early years of the nineteenth century.

The certainty of rapid union with little scarring and the freedom from septic fever obtained by aseptic surgery have, within the last twenty years, greatly extended the number and variety of operations performed for cosmetic reasons alone. The success of skin grafting, bone grafting, and the insertion of foreign bodies as supports and representatives of the tissues, has given oppportunity for original work of a high order in plastic surgery. It is no longer necessary or wise to advise abstention from operations of convenience on the ground that it is better to be satisfied with disfigurement than assume the risks of operative treatment. Practically there are no risks of hemorrhage, sepsis, or gangrene, provided that the operations be done in accordance with recognized surgical principles; and if the operator be

familiar with the recent developments of the plastic art in surgery, or have an original bent of mind, success is almost assured.

It is a well established fact that in this department of surgical endeavor the worst cases give the most satisfactory results. The more horrible the disfigurement the greater is the patient's delight at an improvement in appearance. The surgeon may therefore operate upon a very badly deformed face with almost a certainty of gratifying his patient, even if the final result is not a perfect physiological restoration. It is the man or woman with little abnormality in contour who is apt to be dissatisfied with even a perfect surgical result; because the mind has become warped by constant contemplation of a want, or supposed want, of personal comeliness.

One of my most grateful clients is a man the side of whose face and head was the seat of a congenital deformity which caused him to be known as the dog-faced man. A series of operations relieved him of the canine countenance and lifted him into a condition of mental exhilaration; though to more fortunate persons his final aspect was not that of an Apollo. Another instance is that of a woman whose eyeball and eyelids were destroyed, and cheeks and lips partially destroyed, by fire. The countenance was so improved by a dozen or fifteen operative attacks that she now is willing to go about the streets without keeping her face screened from view, and her mental equipoise is practically restored.

It is certain that deformity of limb and face has long been produced by the criminal classes for the purpose of inspiring wonder and commiseration and increasing thoughtless almsgiving. Double monsters are said to have been made by grafting two children together by backs, buttocks, or arms. The production of a laughing countenance by such sinister surgery has, as is well known, been used as the basis of a novelist's tale. The plastic results obtained in the endeavor to diminish the size of the feet of Chinese girls, to alter the shape of the head in certain tribes of American Indians, and to cultivate dwarf trees of fantastic shape by the Japanese, serve to indicate that the mind of man has long recognized the possibility of perverting nature's processes. The utilization of these same processes should be

more generally brought to the attention of surgeons. Heretofore operators have been perhaps too much taken up with the cure of life destroying conditions to study with care the means of lessening mere disfigurements. It was natural and fitting that the first efforts of surgery should be to prolong life and to lessen human agony, and that its first and greatest triumphs should be won from death, disease, and pain; but now that asepsis, hemostasis, and improved technic have made operations safe, it is proper that surgical luxuries, so to speak, should be given due consideration. The refinements of life are developed after the physical safety of the individual has been assured, and the time has now come when modern surgery may turn its skill to the amelioration of uncomeliness.

In this address it is impossible to describe the many operations which are employed in remedying deformities of the face and ears, but a few may be mentioned as an intimation of those most frequently required. This branch of operative surgery is one in which unusual chance is given for originality. The lesions vary greatly in character and extent, and satisfactory results depend much on the effect the change in contour has upon the eyes of the observer. The newly constructed or altered feature must so conform to the rest of the face as to escape critical attention, or else it must serve to divert attention to other parts of the patient's countenance.

Local anaesthesia, a few moments for excision and suturing, and two or three days without pain for healing seem so insignificant a combination that it is a source of surprise that fleshy warts, sebaceous cysts, and epitheliomatous ulcers are so frequently permitted to remain as facial blemishes.

Hairy growths and capillary angiomas are removable with great satisfaction by electrolytic depilation or by excision. Even a large but smooth and white scar will in some instances be less conspicuous than a port-wine mark. It is often not difficult to convert fistules, sinuses, and distorted scars into scarcely noticeable linear cicatrices.

The ears gave a particularly good opportunity for successful plastic surgery. The two ears are not, as a rule, completely seen at the same time, and as a consequence the surgeon will be con-

sidered highly successful even if the organ upon which reparative operation is done has not the exact shape of its mate. Large auricles may be reduced in size by V-shaped excisions, flaring ears may be drawn close to the head, big lobules decreased in size, keloid growths removed, and fissures or openings due to wearing earrings neatly closed. I have recently been quite successful in making an elevated ridge in a congenitally deformed ear; it had no antihelix, because the cartilage was not normally crumpled. I am at present satisfactorily shaping by mechanical means an auricle in which the cartilage was "buckled" and made the ear lie too close to the head.

The mouth is a feature of great importance in expression, and its impairment by congenital defects of development often requires more than one operation. Its congenital and acquired deformities furnish a wide field for mechanical and operative effort. Indeed a very small part of this field in oral therapeusis and prosthesis occupies the talents of the dental profession. To the cosmetic work of the dentist who corrects irregularly developed teeth, decolorizes dead ones, and replaces those lost with artificial dentures, the surgeon may add a long list of operations upon the lips and cheeks. Protruding or everted lips are reduced in size and altered in shape by well planned operations, hypertrophy of the mucous membrane, causing double lip, is treated by excision, and fissures in the upper or lower lip or at the angle of the mouth are closed by plastic procedures.

The most familiar instance of oral disfigurement is hare-lip. It is so often complicated with deformity of the alveolus and the nose that it affords ample scope for artistic methods of operating. Hare-lip operations may include osteoplastic procedure on the upper jaw, and sometimes must be supplemented by removal of part of the lower lip to obtain a proper balance in the bulk of the two lips. The cicatricial changes made in the mouth by sloughing supply a great variety of operative possibilities. A distorted or contracted oral opening may be altered in shape or diminished or enlarged in size. The tissues of one or other lip or of the chin or throat may be utilized in these plastic reparations.

Nasal deformities and deficiencies cause most noticeable facial disfigurement. The frequency of such conditions arises from the easy occurrence of fracture of the nasal bones and cartilages and the liability of syphilis to attack the nasal structures. Ulcerative destruction may require an ala or the columella of the nose to be made from the cheek, upper lip, or a portion of a finger; or may necessitate the construction of an entire nose from the tissues of the forehead and cheeks, the arm, or some inorganic material such as celluloid, gutta percha, or aluminum.

Flat noses, saddle-back noses, crooked, twisted and angular noses, sunken noses, and noses with bifid or bulbous ends are all susceptible of improvement by nasal or intra-nasal operation. It is quite surprising to some physicians, as well as to most patients, to see what can be done in these directions without noticeable scarring.

These operations on the nose are often valuable, not only for cosmetic reasons, but because they at the same time restore the patency of the nasal chambers and give the patient opportunity to breathe through the nose instead of with a perpetually open mouth. This establishment of physiological breathing improves the voice and lessens the tendency to pharyngeal and laryngeal irritation often so conspicuous. An operation which improves appearances and at the same time improves the health can certainly be claimed as satisfactory.

The eye is currently supposed to be the most expressive portion of the face, and, although this is to a great extent untrue, it is indisputable that imperfections in the cornea and eyelids and want of parallelism in the axes of the eyeballs cause instantly noticeable disfigurement. Bulging or unduly sunken eyeballs may mar an otherwise comely face, and the unsightliness of distorted eyelids is recognized by all.

The various forms of cross-eye have long been treated by operation, but the operation must in many cases be supplemented by a careful correction of the refraction. The wearing of glasses may sometimes be useful in rendering an ocular condition less conspicuous, even when no refractive error is present. For example, a blind and shrunken eyeball may be made to look equal in size to its normal companion by having a convex lens worn in

front of it. A piece of plain glass adjusted in front of the normal eye will have no effect upon its vision or appearance, but will serve to balance the lens on the other side of the nose.

Small eyes, associated as they often are with hyperopia, look larger when proper convex glasses are worn to relieve the asthenopia due to the refractive error.

Drooping upper eyelids, everted or inverted lids, redundant lids, and lids the seat of tumors are all susceptible of operative treatment, which in many instances gives surprisingly satisfactory results. The uncomely bulging seen after recovery from exophthalmic goitre may be relieved by freshening and suturing the eyelids at the outer extremity of the palpebral fissure. This insignificant operation is, however, seldom done. On the other hand a sunken eye may be brought forward by cutting the rectus muscles. This procedure, however, requires special care, as the division of tendons might cause double vision or strabismus. It is perhaps only applicable to blind eyes.

Tattooing of white scars on the cornea, removing conjunctival and corneal growths, and inserting glass eyes, are all cosmetic measures that deserve the attention of the profession. Many of these operations are done frequently by the ophthalmic specialist, but they are either unknown to, or unappreciated by, the surgeon and the general practitioner.

All of them may be done by the surgeon if he has trained his hand to the delicate manipulations required. He will be a better general surgeon if he has acquired such delicacy of touch; as, on the other hand, the ophthalmic surgeon will do better eye-work if he is familiar with the procedures of operative surgery in general.

It is perhaps due to a too high degree of specialism that the cosmetic surgery of the face has had so few exponents. Those who are acquainted with, and can do well, eye operations, nose operations, or ear operations may know too little of general surgery to attempt the more bloody operations upon the face. Those who usually deal with operations like resection of the jaw and excision of the tongue or larnyx may not possess the technical skill to make them safe operators upon the special organs often concerned in facial disfigurements.

The object of this paper is to remind the members of the society of the ease and safety with which operations for the relief of facial disfigurement are performed, the interest of the manipulations, the satisfaction of the results, and the wide field which they offer for scientifically beautiful and original work.

In conclusion, I shall illustrate by crude diagrams, made on the blackboard, the methods by which some of the deformities mentioned may be corrected.

THE VALUE OF ELECTRICITY IN OPTIC ATROPHY AND CHOROIDITIS.

BY ROB'T. F. LeMOND, A. M., M. D., DENVER.

Gentlemen—I take pleasure in presenting to you the result of some experiments which I have had in the last three years in treating optic atrophy and choroiditis largely by electricity. I do not think there is any question but what the majority of cases of optic atrophy can be very materially benefited and the progress of this degenerative process checked beyond all question, if taken in time. As you know, in the majority of these cases, both of these are a lamentable proposition, but I have studied the etiology very studiously, and we know that in the first of these cases it is simply the death of the optic nerve and is caused by a lack of nutrition. So I began about three years ago to see if there was not some value in this the greatest of all stimulants to nerve fibre, electricity, and I apply it in the form of a faradic current. I have had quite a number of cases which I used this on, and in every case where the vision was not very badly impaired have been able to check it, and in a majority of the instances improved the amount of vision.

I have been using this treatment in the various kinds of choroiditis for the past three years. It is not necessary to go into all the different forms, but I will mention some of the most common, viz., the areolar, the atrophic, the plastic and the suppurative. It does not matter so much about the different names of these troubles, as we know that they differ more than the real conditions of the eye.

Choroiditis results, as we know, from various causes. From an etiological standpoint, we have it in extreme cases of myopia, we have it in brain complications of various kinds, we have it in cases where the system is depleted and the vital resistance

lowered, but I believe that the majority of these cases are from syphilitic origin. We all know that cases of well developed choroiditis, where the vitreous is literally filled with coloring matter thrown off from the choroid, are hard cases to deal with.

Reasoning from a scientific standpoint for the past several years, I came to the conclusion that if electricity was such a great stimulant I could not see why it would not exert a good influence upon this condition of the eye; so I began it, and I used it very carefully until I found that I was getting good results beyond all question. So I have had in the past three years some forty odd cases in which I have applied this treatment, and in the vast majority of them I have obtained very satisfactory results, notwithstanding a number of them had been treated with an antisyphilitic course without relief. Then after obtaining such encouraging results from this character of trouble, I decided that if faradism is good in choroiditis, why should it not be indicated in atrophic degeneration of the optic nerve? So I began applying it in these cases, and I have one case, a lady 36 years of age, who had marked atrophy in one eye, with only V. 10-120 in this eye, with the field markedly contracted, and the ophthalmoscopic findings very plain and conclusive. The temporal half of the nerve was pale and swathy, the visual field was contracted, and it was very plain to be seen that atrophy had certainly begun. After treating this lady for two months, daily, her vision measured 15-25.

Case No. 2—A lady 52 years old, with marked atrophy in one eye—and the ophthalmoscopic examination told me at once that it was atrophy. Her vision was so poor in this eye that I could not measure it with any satisfaction, but she could count fingers at twelve inches, and this was about the best she could do. I applied this same treatment, and after some six weeks, making applications every day, her vision in this eye came up to 15-30 plus.

Now, gentlemen, I could report a number of these cases, but will not take your time in reporting cases further. Usually in cases of atrophy I prescribe the sulphate of strychnia—from the 30th to the 20th of a grain t. i. d. in triturate form; and if the system is not in good condition I prescribe the proper medicine

to get it in good working order. For instance, if the tongue is coated, showing that the liver and the lymphatic system is not in good working order, I usually prescribe calomel in broken doses until the tongue has cleared up and indicates that the system is in good working condition.

I have investigated very carefully a great number of authors to see if I could find where faradism was indicated in this character of eye trouble, but I have been able to find but little encouragement—only in one or two works. I find that Giraud-Teulon and Lefort, in Meyer's work on the eye, say that the "constant current has been used to good advantage in absorbing the opacities in the vitreous." I found in the Philadelphia Polyclinic of April 24, 1897, that Dr. de Schweinitz, of Philadelphia, insists upon the value of faradization of the eye in interstitial keratitis.

In conclusion, I will say that I believe that there can be no mistake about the value of this treatment in this character of eye trouble. There is nothing that will tell like living facts.

The form in which I use it is through an applicator covered with sponge. I dip that in water and apply the positive pole to the eye, the negative to the hand usually, and use from one to two or three milliamperes, according to the amount of resistive power of the patient. I have this applicator held gently to the eye for five to six minutes once a day.

SOME CASES OF FACIAL SPASM AND THE ASSOCIATED REFRACTIONS.

BY E. W. STEVENS, M. D., DENVER.

Under the general designations "facial spasm," "mimic spasm," "habit spasm," "histrionic spasm," "painless tic," and "convulsive tic," are included several groups of cases presenting the common clinical feature of spasm of the muscles supplied by the seventh or facial nerves.

The following groups of cases are recognized by Osler[1]:

(a) The secondary form following paralysis and consisting in spontaneous clonic twitchings recurring at irregular intervals in the paralyzed muscles.

(b) Cases due to the irritation of an organic brain lesion, either of the cortex or of pressure on the facial nerve from an aneurism or tumor.

(c) In many cases no cause can be assigned—the idiopathic form of Gowers.

(d) Cases which appear to have a reflex origin and which are associated with irritation in branches of the fifth nerve, as in eye-strain, nasal affections and diseased teeth. This form of spasm is frequently found in children, and, while it may be limited to the facial muscles, is also met with in other groups of muscles. This form of spasm has been called habit spasm by Gowers[2], and habit chorea by S. Weir Mitchell.[3]

Lastly, facial spasm may form a part of the affection described by the French as Gilles de la Tourette's disease, which is characterized by involuntary spasmodic jerkings in certain muscle groups, particularly those of the face, the explosive utterance of obscene words, and fixed ideas.

The symptom picture differs but little in all forms of facial spasm. The patient has lost control over some of his facial muscles, either on one side or both. The spasm is, as a rule, unilateral at first, and may continue throughout to be unilateral, or may become bilateral after a number of years. They are usually of a rapid, electric-like character. There are often a series of quick, quivering contractions. The spasm is usually clonic. If there is tonic spasm, there is almost always clonic spasm as well. In the most common form, the idiopathic, the spasm usually attacks one or two muscles at first, and these at infrequent intervals. The patient or his friends may observe a slight twitching of the orbicularis palpebrarum or of the levator anguli oris. These twitchings become more pronounced, occur more frequently, and may spread to neighboring groups of muscles, and after a time a marked admixture of tonic and clonic spasms is usually observed. Voluntary motion in the muscles is perfectly normal except for the disturbing influence of the spasms. All sensory disturbances are also wanting. There is neither anæsthesia nor pain. At the beginning the muscles most frequently affected are the orbicularis palpebrarum and the zygomatics. Blepharospasm is a spasm, usually clonic, of

the orbicularis palpebrarum muscle, manifesting itself usually by an uncontrollable winking or blinking of the eyelids, the so-called nictitating spasm. A more serious and uncomfortable phase of the difficulty is cramp of the entire muscle, when the eyelids are closed tightly and violently so as to be painful to the patient. In the latter tonic type the lids may remain tightly shut for some minutes, days, or even months, and the patient rendered practically blind from inability to use his eyes. Blindness has occasionally resulted in these cases.

Blepharospasm may be caused by an inverted eyelash, a foreign body producing peripheral irritation, or a corneal ulcer, but we are considering here only that form for which no cause can be found in the condition of the eye or its coverings. The most intractable cases of facial spasm are of this type. Blepharospasm may be due to irritation of the ophthalmic branch of the fifth nerve owing to conjunctivitis, refractive errors and muscular insufficiencies. Often the irritation is reflected from the nose, the teeth, or the pharynx. Dr. Pershing[4] has recorded a case in which he attributed the cause of blepharospasm to prolonged tension of the nervous system. Some cases are of central or even cortical origin. A lesion, however, would have to be very small indeed so to affect the cortex or subcortex as to cause blepharospasm without affecting any other muscles of the face. The so-called functional cases of blepharospasm often obstinately resist treatment. They may be temporarily relieved by pressure upon the branches of the fifth nerve which come from the orbit, or upon the branches of the facial which supply the muscles affected. Sometimes these pressure points, which were first carefully described by Von Graefe, are found on the vertebral column.

Facial spasm is usually strictly confined to the distribution of the facial nerves, but occasionally muscles supplied by other nerves may be affected, showing that the spasms are due to some widely distributed organic lesion affecting, it may be, the trigeminus, vagus or other nerves.

Spasm of the muscles supplied by the motor division of the trigeminus may exist independent of the facial, the "masticatory spasm of Romberg," and may be either tonic or clonic.

Cases of clonic masticatory spasm are seen in which the spasmodic movements are frequently repeated, causing a disorder sometimes spoken of as chattering jaw. The chattering is almost continuous except when the patient is asleep. Is is usually a sign of senility. Trismus, in its narrowest sense, is a tonic spasm of the muscles supplied by the motor branch of the trigeminus and especially of the masseters, in consequence of which the jaws are held tightly closed.

In neuralgia of the fifth nerve, or tic douloureux, reflex spasm may occur in some of the facial muscles, but we are dealing in this paper with only the painless forms of spasms.

Children frequently, and adults sometimes, present spasmodic movements that have a half-voluntary aspect, but which the patients are unable to control. An eye may be rapidly winked, or the eye-ball rolled rapidly upward, or the brow wrinkled, or the facial muscles contorted, or it may be the shoulder is shrugged, or a forward movement of the head or jaw is made. A peculiar fidgety movement of the hand or arm is common. More rarely leg movements occur. In other cases the respiratory muscles are involved and various disordered sounds are emitted by the patient. This group of symptoms has been described by S. Weir Mitchell[5] under the term "habit chorea." Gowers[6], however, considers the name a misnomer and, believing the affection to be a form of spasm or tic, has given it the name of "habit spasm." This affection usually begins between the ages of 6 and 14. Rarely it begins late in life and is then generally permanent. When it commences in childhood the spasms usually cease after a few months or a few years. In adults in whom the disorder has lasted for some time, it is difficult, if not impossible, to arrest the movements.

Often habit spasm arises from nasal diseases, or from diseases of the rhino-pharynx. In the greatest number of cases, however, some ocular defect, as an error of refraction or insufficiency of the muscles, is responsible for the affection, as has been well shown by Wharton Sinkler[7] and G. E. DeSchweinitz[8].

The etiology of facial spasm is often most obscure, the most common type being separated into a class called idiopathic. The origin of the disease is cleared up during the life of the

patient only if after the removal of some primary cause the spasms cease. Many cases are undoubtedly of reflex origin, and especially irritation of the fifth nerve to which the facial has a special reflex relation. Hirt[9] reports a case of blepharospasm which had persisted for years and was considered hopeless, which was cured after a flexion of the uterus had been improved. Bettremieu[10] has recorded three cases of facial spasm due to irritation of the filaments of the fifth nerve in the lachrymo-nasal canal. Many cases of cortical spasm have beeen recorded. One of the earliest and most remarkable of these is the case recorded by Berkley and quoted by Mills. In this case the spasm was confined to the zygomatics of the right side of the face. On autopsy a nodule of calcareous degeneration was found in the precentral convolution of the right side about one and a half inches above the sylvian fissure. Facial spasm is frequently the signal symptom in cortical or subcortical disease. It may be produced by a small gross lesion anywhere from the facial nucleus to the peripheral distribution of the nerve. Cases have been reported in which tumors, aneurisms, or foci of softening or degeneration have produced facial spasm. According to Mills[11] in all these cases due to coarse lesion, whether cortical, subcortical, nuclear, or neural, the spasm is coarser and more irregular in type than in other cases.

A number of cases of facial spasm have come under my observation in the past few years. In some of these cases an examination and treatment of the eyes proved of distinct advantage to the patient; in others the results were negative so far as influencing the spasms was concerned.

Case I. H. E., aged 22 years; occupation, barber; general health good. No history of rheumatism or chorea. For past ten months had complained of eyes closing and shutting rapidly, with a quick snapping movement which had compelled him to abandon his occupation. No other muscles affected. An examination of his eyes gave the following results: O. D. $^4/_6$. O. S. $^4/_6$—Esophoria seven centrads. The external anterior segments of the eyes were normal, and there were no notable changes in the fundus. There was distinct dread of light. Atropin was ordered and continued for about a week. Under this mydriatic

the refraction was found to be O. D.+0.50s=+1.00c ax 60°. O. S.+ 1.50c ax 123.

These glasses were ordered for constant wear. Constitutional treatment was given in the form of Fowler's solution of arsenic in ascending doses. In four months the blepharospasm had entirely disappeared.

Case II. A. B., aged 44 years, a carpenter by occupation, applied for treatment at Dr. Edward Jackson's service at the Wills Eye Hospital, Philadelphia. This patient was of fine physical development, with no personal or family nervous history. For the past ten years had had severe bilateral blepharospasm of the clonico-tonic type. For several years had been unable to attend to work on account of the violence of the twitchings. This case had been under the care of several competent ophthalmologists and neurologists and had taken long courses of arsenic galvanism and anti-spasmodic remedies without avail. Both facial nerves had been stretched with recurrence of spasms in a few months. The examination of his eyes gave the following results:

O. D. $^1/_8$. O. S. $^1/_8$. The conjunctiva was injected, but not catarrhal. Small oval optic discs with retinal strictions above and below.

Under Dubosin the refraction was found to be O. D.+1.00s= +1.50 cyl ax 90°. O. S.+1.50s=+1.00c ax 90°. The full correction was ordered, but no improvement had followed when the patient removed from the city a couple of months later.

Case III. Mrs. Mary G., aged 40 years. In fair general health. When 24 years of age she first noticed twitchings of lids of both eyes, which has slowly grown worse, in spite of treatment. For years she had been unable to read or use her eyes for near work. She now presented violent clonic bilateral blepharospasm with involvement of the zygomatics. The eyes were as follows: O. D and O. S. $^1/_4$. Amplitude of accommodation, 4 D. Esophoria 3 centrads. Anterior segments and fundi normal in all respects, and under atropine mydriasis the patient was found to be wearing her right correction, +100D in each eye.

Both facial nerves were now stretched under ether, and the stretching was repeated two days later, as very little influence

had been produced upon the spasms by the first operation. The second vigorous stretching caused facial paralysis, with, of course, entire cessation of the spasms. Unfortunately, with the return of voluntary power in the muscles, in six weeks, the spasms also returned with former force and frequency.

Case IV. Miss B. S., aged 17 years. A remarkably healthy-loking, well-nourished girl. This patient was of a highly excitable, nervous temperament, inherited from her father. For the past six months she had suffered from rapid blinking and shutting of her eyes, jerkings of her head and at times twitchings of her arms and legs. During this period she was under the professional care of a well-known neurologist.

An examination of the eyes had been made, but owing to the lack of control of the patient it was regarded as imperfect and unsatisfactory. My examination yielded the following results:

O. D. $^4/_{30}$. O. S. $^4/_{20}$. Lids, lashes and conjunctivae were normal and corneæ clear. It was beyond my power to test the muscle balance or obtain a satisfactory study of the fundus, on account of the jerkings of the patient and the marked dread of light.

Atropine mydriasis was produced and kept up for about ten days. Under this the refraction by the shadow test was found to be O. D.—1.00s=—2.00 Cyl ax 30°. O. S.—1.50s=1.50 Cyl ax 180°. A full correction was ordered, and arsenic was once more given in ascending doses. One month after, the spasms had nearly subsided, and at the end of two months they had entirely ceased. There had been no return of the spasms two years after, when I last saw her.

Case V. Mrs. H. R. H., aet. 36 years, referred to me by Dr. Jameson, of Philadelphia. This patient was a finely developed woman in perfect health. Ten years ago she first noticed twitchings of lids of the left eye, which after a few months was accompanied by twitchings of the muscles of the face on the same side, and has gradually grown worse. During this time she had consulted many of the most eminent neurologists both in this country and abroad, being for several months under the care of the late Prof. Charcot. Strange to record, during all this treatment, by electricity, arsenic and anti-spasmodics, her eyes had never

been examined. The examination of her eyes now showed that they were normal in all respects with the exception of a refractive error of +0.50D in each eye. These glasses were ordered for all near work, but, as was expected, without the slightest influence upon the force or frequency of the spasms.

Case VI. Alice C., aged 8 years. For past two months had had persistent spasmodic bilateral winking, compelling her withdrawal from school. No history of rheumatism. No twitchings of muscles of face or jerkings of limbs or head. The eye examination was as follows:

O. D. and O. S. $^4/_6$. Muscle balance not taken.

Refraction under atropine gave O. D.+1.00 Cyl ax 90°, O. S. +1.00 Cyl ax 90°. This was ordered for constant wear, and arsenic given in increasing doses. Six weeks later the winking was entirely cured.

These cases illustrate the importance, in the treatment of facial spasm, of fully correcting the error of refraction in conjunction with proper internal medication. It is essential in every case to determine the existence of the cause and remove it. It is not my intention to attribute to errors of refraction an undue importance as existing agents in the causation of facial spasm. A large number of cases may be directly traced to diseases of the pharynx and nasal diseases, as has been pointed out by Jacobi;[12] and in a still larger group no cause can be assigned. I wish to emphasize the following points:

(1) The refraction and muscle balance should be carefully examined.

(2) The refraction should be determined under complete mydriasis and the full correction ordered.

(3) It is not sufficient to get rid of the cause, for the nerve centers, having acquired a vicious habit, do not recover their normal condition until systematic treatment has been pursued.

References.

[1] American Text-book of the Theory and Pract. of Med., Vol. I., p. 832.

[2] Diseases of the Nervous System, 2d Ed., Vol. 2, p. 633.

[3] Lectures on Diseases of the Nervous System, Lect. VIII.

[4] Am. Med.-Surg. Bull., June, 1895.
[5] Loc. cit.
[6] Loc. cit.
[7] Am. Journal Med. Sci., May, 1897.
[8] Proceedings Phila. Co. Med. So., 1888, p. 144.
[9] Diseases Nervous System, Hoch's Trans., p. 81.
[10] Archives D'Ophthalmologie, April, 1899, p. 246.
[11] The Nervous System and Its Diseases, p. 922.
[12] Am. Journal Med. Sci., 1886.

DISCUSSION ON THE PAPERS OF DRS. LeMOND AND STEVENS.

Dr. Edward Jackson—I only wish to say a few words in reference to Dr. Stevens' paper. The reading of it perhaps hardly gives an impression of what the paper is really worth. I have looked it over, and I know from the literature of the subject that it brings together what is known about it as it has not previously been brought together.

Dr. Stevens referred to several American papers on the subject. The American and a little English literature, I think, comprise the literature on the subject. I looked in Schmidt-Rimpler's recent work, which gives about two hundred references to papers on diseases or lesions affecting the eye muscles, in connection with general diseases, and it does not mention this subject—does not refer to any paper discussing it. Yet this is a class of cases that probably most of those in attendance have occasionally met with, and they are cases that are very persistent in seeking for relief, as the histories that Dr. Stevens read illustrate. Although the correction of errors of refraction utterly failed to relieve a large proportion of these cases, other treatment failed to relieve any of them. There seem to be a few that are thus capable of relief, but a large proportion certainly of those that come to the ophthalmologist are not relieved at all.

The relief obtained by correcting the error of refraction is probably indirect. It is probably secured by relieving an irritation about the conjunctiva or lid. The spasm in these cases probably comes about in the same way as the spasm noticed in phlyctenular disease of the eyes, or as the spasmodic contraction of the orbicularis muscle that causes entropion in trachoma. When

there is such a local lesion that is the source of spasm, I think these cases can be relieved. The cases that are not relieved are the cases in which such irritation is absent, and the spasm depends on central causes.

These cases are also of interest through their connection with those in which movements of the eyelids are abnormally associated with movements of other parts of the face. I have seen one case, undoubtedly congenital, in which this association was very striking. It was a colored man, a dark mulatto, who was a great stutterer, and his attempts to speak always commenced with a complete closure of the eyes; there was a complete spasmodic closure of the lids, and that closure continued until his speech was fairly started, and then he could open the eyes. When he got into the full current of speech he could sometimes say a whole sentence without an interruption, and could keep his eyes open.

I have seen one case in which a remedy was tried of which Dr. Stevens has not spoken, namely, a local surgical procedure, canthoplasty, but it was quite as ineffective as the surgical proceedings which he mentioned directed to the destruction or division of the nerve trunks.

Dr. G. M. Black—Dr. LeMond's paper presents experience on his part which is certainly unique. Those who have attempted to cure optic atrophy have, so far as I am aware, not yet found a remedy of any kind of much value. We have come to believe that there is not very much hope for a case of optic atrophy. The doctor seems to take a very sanguine view, certainly more so than I have ever been led to believe was justifiable. My experience with the faradic current in optic atrophy has been limited, probably because I have had but very little confidence in it. I have, however, tried it, and I think it has been very largely tried by others, and, if I am not mistaken, with but little success. It has been practically abandoned by almost every one who has tried it. Dr. LeMond may have struck a secret which we are not able to fathom, and it is to be regretted that he did not tell us more explicitly how to use the current. The cases he has reported are monocular, and it is rather unusual for optic atrophy to attack one eye alone. It is also to be regretted that he did not give a more extensive history of these cases. As

to the use of the faradic current in diseases of the choroid, I have used the current there for several years, more as a placebo, I must confess, than with any direct idea of its being of any great benefit. It is oftentimes desirable to keep these patients under observation, and if you do not do something with them they probably will slip out from under your care. For that reason I have been in the habit from time to time, in certain cases where I believed that the use of a placebo was justified, of using the faradic current, but I have never been able to see that they derived any benefit from it. I hope that Dr. LeMond will tell us a little more explicitly how he manages these cases, that is, if he uses the faradic current as we have all been using it, or if he has some secret which he has not confided to us.

Dr. Stevens' paper is certainly a fine rendition of this subject. I am sorry he does not give us anything which is going to cure these cases, but I guess it is not his fault. They seem to be beyond the domain of cure pretty largely, except in a few cases where the refraction, when corrected, seems to benefit them, or where some peripheral irritation can be located and removed.

Dr. Love—I would like to ask Dr. LeMond what wire he uses, whether he uses the fine wire or the coarse wire or the medium.

Dr. LeMond—The fine wire.

Dr. E. W. Stevens—Several years ago, influenced by the reports by Drs. E. Riggs and L. Webster Fox of cases of optic nerve atrophy successfully treated by voltaic alternatives, I began the treatment of a number of cases of the disease by this method. The results were entirely negative notwithstanding I had the assistance and coöperation of physicians well equipped in electro-therapeutics.

Before we can establish the status of electricity in the treatment of atrophy of the optic nerve, a proper classification of the types of the affection thus treated must be given by the reporters, i. e., whether this atrophy is primary, secondary or consecutive, stationary or progressive. Moreover, the most exact measurements of vision, both direct and indirect, before and after treatment, should be given. These deficiencies are notable in Dr. LeMond's paper, as well as in most of the records of cases treated

by others, and render them absolutely valueless for scientific purposes.

Notwithstanding the rose-colored reports of the value of electricity made by some ophthalmologists, I believe the great majority of careful observers are in accord with the assertion of Noyes that electricity has failed to vindicate its pretensions to any real value, although by its capacity for exciting phosphenes it fosters the hopes of a credulous incurable.

Dr. LeMond—In answer to one of Dr. Black's questions, as to not affecting both eyes, will say that in nearly all of the cases of atrophic degeneration there is one eye that becomes affected first, and I do not make the assertion that after atrophy has advanced to a great extent and practically destroyed the eye anything can be done. But if we know anything about electricity at all, that is Faradism especially, we know that it is a very great stimulant. I am sorry that I do not know more about it. But in confessing my ignorance on this question, I will say that some time ago Mr. Edison, of New York, who is at the head of all the electrical advancement of to-day, was called on and was told that he evidently understood what electricity was and they wanted him to tell them something about it. They said that in the first place they wanted to know what it is. "Well," he says, "in the first place I will tell you I do not know. I know it is a wonderful stimulant, a great power. Outside of that, I don't know what it is." I know this, that the faradic current is considered a very much more stimulating current than the galvanic current. The even current is not the stimulant, has not the stimulating effects, that the faradic current has. If we understand anything at all about atrophy, we understand that it is a degenerative process for the want of nutrition. Then if electricity is a good stimulant of the nervous system, which all neurologists will tell you it is, would it not be indicated in such cases as this? I do not say, gentlemen, that in the advanced cases of atrophic degeneration this treatment will restore them at all. I do not make any such assertion, but I could report quite a number of cases in which I have had the same results as with those I have just reported, and I feel perfectly satisfied that there must be something in it. I have

made a record of those cases and kept right up with them, and they would not have gotten well, I think, under the mild course or medicinal course of treatment I was giving. Then, besides, I have made some experimental tests. I have used other treatment on some and then after I found they were not getting any better I would apply the electricity and improvement would follow. I want to say that since I have been advocating this theory I have received a number of letters throughout the country from several different persons saying that they believe there is something in this. I would be glad to have you all try it.

Now, in reply to Dr. Stevens' question, I will say, as I understand it, the milliampere meter can be used on any kind of a current, either galvanic or faradic. You can turn it on heavy or light, just as you like. Some patients have more resistive omes, as they are called, than others. Those who are inclined to perspire a great deal and have a great deal of salt in the perspiration have a great deal more resistive power than others who do not, and it takes with the former a great deal stronger current. So far as reporting more cases than I have, I do not think it is at all necessary before this body.

CONTUSIONS OF THE EYE.

BY WILLIAM C. BANE, M. D., DENVER.

A bruise or laceration of an eye, without a rent in the conjunctiva, constitutes a contusion. The damage done to an eye by a blow varies from a slight effusion of blood beneath the conjunctiva to a rupture of all the tunics, laceration of the iris, and dislocation of the lens to the total loss of vision. Often paralysis of the iris and ciliary muscle, with irregular dilatation of the pupil—which may be but temporary—are the only results of a blow on an eye.

The common seat of injury is in the sclera near the cornea, the latter usually escaping. Rupture of the choroid and retina occurs from a direct blow and by counter shock, the latter rent being generally in curved lines or bands. With rupture of the

iris, hyphaema or hemorrhage into the anterior chamber takes place, from which the effusion is rapidly absorbed, while with a rent in the choroid and retina blood escapes into the vitreous. Detachment of the retina often follows blows that have caused rupture of the choroid. "Effusion into the vitreous is tardy in disappearing, seriously impairs vision and is little amenable to treatment."* Internal damage may be caused by a blow without rupture of the sclera or cornea. Blows in the ciliary region are likely to be more serious than if elsewhere, though hemorrhage from the ciliary body is more readily absorbed than if from the fundus.

The damage to vision varies from slight impairment to total and permanent loss, depending upon the nature and extent of the injury. We may have rupture of the optic nerve without apparent contusion of the ball.** In severe contusions of an eye with evidence of effusion of blood into the vitreous and a possibility that the retina is detached, or where the iris is partly detached or tremulous, a very guarded prognosis should be given.

The iris and ciliary muscle can best be quieted with atropine. Local depletion by the artificial or Swedish leech is indicated in the early stage of the severer cases of contusion. Ice cold compresses or an ice poultice, consisting of equal parts of pounded ice and bran in a water bag, during the first few days following the injury will invariably keep down the inflammation.

Myopia and astigmatism may follow a blow on the eye, owing to an altered position of the lens.

During the evening of August 1, 1898, E. H. B., aged 44 years, was referred to me by Dr. Charles Jaeger, he having received an injury to his left brow, cheek and eye. There were two horizontal cuts in the brow near the outer angle, each about half an inch long and a quarter of an inch apart. The lower eyelid was cut in two places; the outer wound was five-eighths of an inch long, parallel with and about half an inch below the outer canthus. The other cut was one-fourth of an inch long, near the inner canthus, parallel with the margin, and one-fourth of an inch below it. None of the wounds were

* Noyes on the Eye, page 478.

** Taylor, Trans. Oph. Soc. United Kingdom, volume 13, page 155.

more than one-eighth of an inch deep. The left upper eyelid was very much swollen and of a dark purple color. The conjunctiva of the eyeball was greatly swollen, ecchymotic and protruded from between the lids when they were held open. The cornea was sound. The anterior chamber was three-fourths full of blood. The pupil appeared two-thirds dilated. No red reflex was obtainable and it seemed evident that hemorrhage had taken place into the vitreous. Vision with the right eye was normal; that of the left was barely light perception.

On August 2 the patient was able to open the lids slightly. Anterior chamber was half full of blood. The pupil was partially dilated, yet no view of the fundus was obtainable. The vision equaled light perception.

August 3 the eye was but slightly painful; patient could notice an object, as a hand passed between the eye and the light, but could not name it. The anterior chamber was one-fourth full of blood. Tension =+1.

On August 4 there was a reduction in the swelling of the lids and conjunctiva, the eye being free from pain. Tension was normal. Some red reflex obtainable. Vision for fingers at one foot.

August 5, or fourth day after injury, the pupil was large and of an oval shape, being more dilated on the nasal than the temple side. The iris was steady. Two dark streaks or lines crossed through the vitreous from the nasal side, a little above the center, being about one mm in thickness and two mm apart.

August 6, the eye was free from pain; the vitreous had cleared considerably. The vision equalled $^{1}/_{60}$.

August 8, vision $=^{2}/_{50}$. Marked diminution of the swelling. The pupil was large and regular. There were several dark linear opacities that crossed the vitreous on and above the horizontal plane close to the posterior surface of the lens; there were also some floating opacities in the vitreous. A dim outline of the disc could be seen. The retina appeared to be intact.

On August 13, twelve days after the injury, there was manifest a projection from the sclera, four by four mm by two mm above the surface near the inner margin of the cornea. It con-

tained some pigment deposit, indicating that the sclera had been ruptured at that point and some of the pigment layer had been incarcerated in the scleral wound. The view obtainable into the interior showed plainly that the hemorrhages were from the ciliary region into the vitreous from a point corresponding to the pigment deposit beneath the conjunctiva.

October 1, 1898, two months after the injury, the dark linear deposits remained in the vitreous, though they had cleared somewhat. The pigment deposit on the sclera was half the size it was six weeks previously and of a brownish hue. Vision $=^{6}/_{60}$. The patient was informed that the eye was permanently damaged.

It will be noted that previous to the twelfth day following the injury there was no evidence that the sclera had been lacerated.

On the 11th of the present month (June, 1899), I reëxamined the eye. I find that a marked improvement has taken place during the preceding eight months. Vision is now $^{6}/_{30}$. The vitreous has become quite clear. There exists but a faint film in the lines where the dark streaks were. The fundus reveals no pathologic change. At the seat of injury in the sclera there remains a linear gray pigmented projection about one mm above the surrounding surface. There is manifest myopia and myopic astigmatism. The correction of the errors brings the vision up to $^{6}/_{9}$—. Pupil of the left eye is one-third larger than that of the right. Both pupils respond normally to light and accommodation and the fields for white are normal.

FOREIGN BODIES LODGED WITHIN THE EYE-BALL.

BY EDWARD JACKSON, A. M., M. D., DENVER.

Diagnosis.

Every penetrating wound of the eye-ball should be carefully studied as a case of possible lodgment of a foreign body. The patient's account of his injury is always defective, and often

misleading. Only careful cross-questioning will show how much of value there is in it. A foreign body, having entered deeply, does not cause the sensation of "something in the eye," and the patient, impelled by hope, is often very positive that nothing is lodged there. The diagnosis must be entirely independent of such testimony.

Every detail of the accident should be minutely investigated. If the body that inflicted the wound is obtainable, it should be examined, to see if any portion has probably broken off and remained within the eye, or if it has acted as the carrier of adherent and possibly infective substances. Even an eyelash or bit of epithelium from the lid, embedded in the iris, becomes the starting point of a cyst. A slightly irregular edge or point would be very likely to introduce foreign matter, while a perfectly smooth point or edge would probably enter the eye cleaned by its passage through the sclero-corneal coat.

If the eye has been struck by a flying fragment this should be carefully sought for. When it cannot be found, inspection of the part from which it has broken will give valuable information as to its size and shape. Then the relative position of the point from which it flew, the exact attitude of the patient, and the direction in which he was looking at the instant, may throw valuable light on the probable position of the foreign body.

To illustrate the possible importance of exact observations of this kind, I may mention the case of a man sent to me from another hospital that he might have the benefit of an attempt at magnet-extraction before resorting to enucleation of the eye for a fragment of steel that was believed to have lodged in it. There was a penetrating wound of the cornea, from which a gash deep into the cornea, but not entirely through it, passed upward and to the right. Careful questioning showed clearly that the foreign body had come from below and to the left. It could not have entered the eye through the perforation in the cornea and afterward have cut the gash. But it must have struck the eye a glancing blow, hard enough at first to penetrate the cornea and iris, and afterward plowing its way through only a portion of the thickness of the cornea as it passed onward.

The case was treated on this supposition which its subsequent history sustained, the patient retaining a sound and useful eye which would certainly have been damaged if it had been subjected to prolonged attempts at extraction of the foreign body, which was not lodged in it.

Beside the careful inspection of the external wound and the anterior segment of the eye by oblique illumination, every case of foreign body in the eye should be subjected to a thorough ophthalmoscopic examination *at the earliest possible moment*, before increasing cloudiness of the crystalline lens, or diffusion of opacity due to hemorrhage, renders such an examination well-nigh useless. Even when the foreign body can not be seen with the opthalmoscope, its position may often be indicated by a streak of commencing opacity in the lens, or air-bubbles or shreds of hemorrhage marking its track through the vitreous. Such signs not only show the location of the foreign body—they are of greatest importance in making certain that it has really passed into the eye.

When the fact that it has entered the eye-ball seems clear, we must also consider whether it may not have passed entirely through the eye-ball and lodged elsewhere. I have seen two cases in which this occurred.

One was that of a young man struck in the left eye with a No. 6 shot. He was not seen until the ninth day, when the lens was greatly swollen, the tension of the eyeball +T.2, and a violent irido-cyclitis called for enucleation. I suspected, however, that the shot was not in the eye, because of the very clear history the patient gave of instant complete blindness, which would be very unlikely to occur, except from a much more extensive injury of the globe, unless the optic nerve was injured. On examining the eye after removal, the wound of exit was found just at the margin of the optic nerve, the nerve had been divided, and the shot having passed deeper was not found.

In the other case a large piece of steel was known to have entered the eye. The patient was etherized and a careful search made for it with the electro-magnet. It was not found. Two days later ecchymosis appeared at the upper and lower margins of the orbit and under the conjunctiva; and there was marked

protrusion of the globe, showing that the foreign body had probably passed through the eye-ball into the orbit and had there caused hemorrhage. Three months later, when the shrunken globe was enucleated, we found the foreign body just back of the eye-ball.

This case was seen in 1892. In a similar case occurring now the X-rays would certainly reveal the position of such a foreign body. This valuable aid in diagnosis should be resorted to in all cases of suspected foreign body in the eye where the exact location of the foreign body can not be made out by examination under oblique illumination or with the ophthalmoscope. Making two negatives with the tube placed in different positions, with some known fixed point the shadow of which can be used as a point of reference for the shadow of the foreign body, it becomes possible (especially by the method of Sweet) to determine the location of the latter with great exactness. Unfortunately a foreign body may be so small that it will give no perceptible shadow on the sensitive plate and yet be large enough to cause the destruction of the eye. I have had one case in which many trials with the X-rays failed to give any evidence of the presence of a small particle of steel, although it was clearly visible in the fundus with the ophthalmoscope.

Sweet, who made the radiographs in this case, has recorded another (*Archives of Ophthalmol.*, July, 1898, page 393) which indicates the present limits of the diagnostic value of the X-rays in this direction. Only one of four negatives showed any trace of a shadow of a foreign body, which, on removal, was found to be over 1 mm long, less than 1 mm wide, and 0.5 mm thick at the thickest part. Fragments smaller than this rarely strike the eye with sufficient momentum to carry them to the deeper portions. They are commonly arrested in the cornea, iris, or lens. Still we must bear in mind the possibility of their reaching the deeper structures and causing the most disastrous effects.

In considering the prognosis and treatment of eyes containing foreign bodies, it is best to divide the cases into three classes, according as the foreign body is located (1) in the iris or anterior chamber, (2) in the lens, or (3) in the vitreous or fundus.

Among twenty-five successive cases of foreign body lodged in the eye-ball the location of the foreign body was in the iris and anterior chamber in three, in the crystalline lens in four, and in the vitreous and fundus in sixteen. In one case it was partly in the iris and partly in the lens, and in the following case a foreign body apparently simply lying on the iris extended back through the zonule and into the vitreous.

J. D., aged 23, laborer, applied at Wills Hospital, January 8, 1898. The left eye had been struck by a flying piece of steel the evening of the preceding day. There was an irregular linear wound 6 or 8 mm long, nearly vertical, in the central part of the cornea, and what appeared to be a triangular bit of steel, 3 mm on a side, at the lower part of the anterior chamber. An incision was made extending through the lower quadrant of the corneal limbus. An attempt to withdraw the foreign body and adjoining iris, with iris forceps, met with unexpected resistance. The foreign body was then coaxed out with the electromagnet, and was found to be 9 mm long, having extended back into the vitreous, it being only the head of the fragment that projected into the anterior chamber. The injured portion of the iris was excised, the patient placed in bed, and atrophin and ice compresses used locally. The patient left the hospital at the end of five weeks with the eye quiet and vision $=^{5}/_{40}$, in spite of the corneal scar, and some opacity in the lower part of the lens and lower anterior portion of the vitreous.

Treatment and Prognosis.

When a foreign body is lodged in the iris or anterior chamber, its location is usually evident, and its removal comparatively easy. It should be removed as soon as possible. The only exceptions I would make to this rule are if the seat of lodgment is in the lens, or if the foreign body has been retained for some time and the eye has become entirely quiet, and the patient can remain within reach of skilled assistance in case irritation should arise. Powder grains are occasionally lodged on the iris, or in the lens. I have never seen them penetrate more deeply than this, although sometimes they have done so; and in the great majority of cases they are arrested in the cornea. When, after such an accident, the eye has become entirely quiet, the finely

powdered charcoal that remains of such a grain is not likely ever to cause irritation. But such grains are at first very irritating, and the eye may be lost while one waits for it to become quiet. If seen early these injuries should be treated as other cases of foreign body similarly situated; as illustrated by the following case:

J. O. D., a farmer, aged 20, had been injured by an explosion of gunpowder the preceding day. In the right eye there was one grain of powder embedded in the cornea. In the left eye there were several grains of powder embedded in the cornea and iris, as well as in the conjunctiva. There was severe swelling of the lids, and inflammation of the conjunctiva with purulent discharge. The cornea was generally hazy.

The patient refused to go into the hospital, or to have any operation done. A solution of atropin was ordered. In four days he returned decidedly worse and was admitted to the hospital. Under general anæsthesia an incision was made at the lower outer border of the cornea. Five or six powder grains were picked from the front of the iris with the forceps, and about one-sixth of the iris, the lower outer portion, containing several embedded powder grains, was excised. The grains in the cornea and conjunctiva, and in the lids and skin of the face, were subsequently destroyed by the galvano-cautery. In fifteen days the eye was free from irritation and subsequently obtained vision equal to $.^{5}/_{10}$.

It is sometimes possible to disentangle a foreign body from the iris and remove it, leaving the iris intact. But generally it is easier and safer to do a small iridectomy, removing with the foreign body the part of the iris that has become injured or possibly infected by it.

A foreign body lodged in the crystalline lens causes traumatic cataract. If the wound of entrance be small, several weeks or even months may elapse before the opacity of the lens becomes complete, and the accompanying swelling will be very moderate. But if the opening in the lens capsule be large, the opacity increases rapidly and is attended with great swelling of the lens and sometimes increased tension of the eyeball. Aside from this there is little liability of a foreign body in the lens causing serious inflammation, or an irido-cyclitis ending in a degen-

erated eyeball. It is proper, therefore, to allow the traumatic cataract to develop, and then to extract it in the ordinary way, being careful to make a rather large corneal incision, and, if needful, doing an iridectomy to allow the free escape of the lens mass. Taking such precautions I have never failed to remove the foreign body with the lens mass. If the foreign body be not thus removed, the traumatic cataract will slowly shrink, and ultimately, in most cases, will be entirely absorbed, allowing the foreign body to come in contact with other structures and cause serious damage. I have seen a chip of steel, hanging in the remains of the lens, beginning to cause serious inflammation twenty-eight years after the original injury; the eye having, according to the patient's statement, remained quiet all that time.

A foreign body entering the vitreous and lodging there or in the retina, choroid or ciliary body, is almost certain, if not promptly removed, to set up such inflammatory and degenerative changes as in the end render the eye functionally useless and a menace to its fellow through sympathetic disease. In very rare cases this does not occur. Foreign bodies of moderate or small size, entering through the cornea, iris and crystalline lens, are much less likely to set up a fatal irido-cyclitis than those which enter more directly through the sclera. Smooth and aseptic particles, as birdshot or splinters of glass or hot metal, are less likely to set up chronic degenerative changes; and small particles firmly fixed in the fundus are sometimes compatible with useful vision. I have met one case of this sort:

E. E. L., aged 32, express messenger. The right eye was struck with a small particle of steel twenty-one years ago. It now has vision $=^{1}/_{40}$, tension is normal, it diverges (comitant strabismus), and has circular pupil and normal iris. There is a faint track of opacity through the lens, with radiating opacity of the posterior cortex. The vitreous and fundus seem normal except that the optic disk is red and hazy, and to the temporal side of it, 1.5 disk diameters from it, is a patch of choroidal pigmentation and atrophy in which is an irregular quadrilateral, the diameter of the disk in length and one-half as wide, black, with light gray on the edges, apparently protruding in front of the retina.

The patient was shown before the section of ophthalmology of the College of Physicians, of Philadelphia, and those who saw it agreed that the quadrilateral mass seemed to be a foreign body. A year later there had been no perceptible change in the condition of the eye.

A few cases of this sort have been from time to time reported; and they should be taken into account when giving a prognosis, or when the eye has become quiet or is becoming quiet when it is first seen. But they should not deter the surgeon from attempting the immediate removal of a foreign body from this region whenever its presence and location can be certainly known soon after it has been lodged there. The chances of retaining a useful eye, or an eyeball that will not be dangerous to its fellow, are greatly improved by such removal. For particles of steel or iron, magnet extraction is the nice and scientific method of removal; but if, because of the lack of the necessary apparatus, or because of the composition of the foreign body, or the firmness with which it is embedded, magnet extraction is impossible, if the location of the foreign body is accurately known, I believe we should always attempt its removal with scoop or forceps.

The details of such removal must be specially adapted to each individual case. There is no time now to discuss them. But this one point I would insist on: With the foreign body should be removed all badly damaged or probably infected tissue—the track of the foreign body through the vitreous, and the bed of tissue in which it lies. This can only be accomplished through a free scleral incision, made, if possible, through the point of entrance. Half the vitreous may be lost in a cataract extraction without serious consequences; and equally large losses of vitreous will be equally harmless in these cases if we can only eliminate the infection.

If we can save 10 or 15 per cent. of useful eyes by the extraction of the foreign body with the magnet as heretofore generally practiced, we can save two or three times as many by the careful application of well-known surgical principles to these injuries. To make a chip of steel jump from the wound of entrance with a giant magnet may seem a very brilliant operation

to the bystanders. But it is a very useless one to the patient if it leaves a track of infection within the eye, certain to result in its ultimate destruction. Surgery has no place for "successful operations" that work no permanent benefit for the patient.

FOREIGN BODIES ON THE CORNEA.

BY MELVILLE BLACK, M. D., DENVER.

The presence of a foreign body on the cornea is usually considered so simple an injury that few consult a physician for its removal until other means have been tried. Almost every factory and machine shop has a workman who is considered by his companions to be an expert at removing particles of emery or other bodies from the cornea. This individual is usually credited with having very "sharp sight." Extraordinary vision is not required to locate the situation of a foreign body on the cornea. If the iris is of light color and the foreign body dark, or if the iris is dark and the foreign body light in color, its presence is easily detected; but if the reverse obtains, i. e., a light-colored iris and a light-colored foreign body, or a dark-colored iris and a black foreign body, more patience is required for its detection. A piece of glass or a clear piece of sand, when embedded in the cornea, is so nearly like the cornea in its appearance that its detection is best determined by the presence of a fixed raised surface on the cornea or a disturbance of its continuity. The examiner in this case must place himself in position to get the reflected light from the cornea. If the foreign body is very small, it will be necessary to use a lens for focal illumination. The source of illumination should be artificial light. The lens should have a focal distance of about two and a half inches. If the right eye is the one injured, the light should be about two feet to the patient's right, and about a foot in front of him. The examiner should stand from about eight to twelve inches from the eye under examination, and to its left. The lens should be held between the light and the eye examined, and about three inches distant from the latter, so that the rays of light will fall upon

the cornea slightly out of focus, when, as the lens is moved about, the cornea will have a slightly hazy appearance. The foreign body will stand out with great prominence in the hazy zone of illuminated cornea. If a still more sensitive test is required, a second lens can be used to magnify the part under examination. This will render the foreign body several times larger than it really is and make it still easier of detection. Unless the examiner is very expert, he will find a lens for magnifying that has a focal distance of from four to six inches the most serviceable. Two such lenses, as mentioned, should be carried constantly by every physician who is frequently called upon to remove foreign bodies from the cornea. I dwell especially upon the method of examination, because foreign bodies are so frequently overlooked by physicians only to be detected by some layman or by some other physician who is consulted later. A foreign body embedding itself in the cornea may give little discomfort for several hours. This is especially true if it is lodged near the periphery of the cornea, or if it is sunken into the substance of the cornea sufficiently far not to project above its surface and scratch the eyelid during the act of winking. If the foreign body is of a nature to undergo oxidation by its passage through the air to the eye, it becomes hot and is in a measure rendered aseptic. It will be found embedded in a zone of burned cornea. In this condition it may remain many days before it will be thrown off by nature's method. The cornea tends to get rid of these offending particles of foreign matter by a process of retrograde metamorphosis. The corneal substance about the foreign particle becomes softened, the body is no longer afforded good support, and finally drops out of its bed into the conjunctival sac and is washed away by a flow of tears. In its former site there will be found what may now be termed an ulcer. We have a focus of infection which may or may not undergo resolution. This would depend upon the nature and extent of the infection. Before the activity of the septic process can be arrested, serious damage to vision may ensue.

Since it is so common for physicians to be consulted as a *dernier ressort* by patients who have foreign bodies on their corneæ, it is necessary to consider what has been done before they have consulted us. The layman rarely has cocaine at his com-

mand with which to anæsthetize such an eye. Without its use the eye can not be controlled. It rolls about with the cornea under the upper lid in a most exasperating way. When, after a heroic effort, the patient turns the eye down, exposing to view the cornea with its foreign body, a dab is made at it with the corner of a pocket handkerchief or whatever convenient instrument may be at hand. As the cornea is touched the eye closes with a snap and the patient's head flies back out of reach. The operator makes another examination only to find the offending particle still present on the cornea. His effort to extract it has more than likely embedded it more firmly in the corneal substance. A few such experiences and the patient goes to a physician. It would seem that little damage so far has been done. This remains to be seen. I have seen two cases of gonorrhœal ophthalmia as the result of infection from the handkerchief or the hands of some friend who has attempted the removal of a foreign body from the cornea. In both cases I was able to learn that the friendly operator had gonorrhœa. I have seen many patients with acute conjunctivitis and even trachoma who dated the beginning of their trouble from having a foreign body removed from the eye by some friend. The possibilities of infection to the lacerated corneal substance are very great. The infection may be so extensive as to produce not only ulceration, but corneal abscess, or even ophthalmitis. Local diseases of the eye, especially of the tear passages, are capable of infecting a cornea wounded by a foreign body. Some of the worst cases of infection I have ever seen have resulted from a purulent inflammation of the lachrymal passages. We are never justified in treating a case of foreign body on the cornea as a trivial affection when former attempts have been made to remove it, or when local diseased conditions of the conjunctiva or lachrymal passages are active. It is much safer to make a guarded prognosis, and at the same time take every antiseptic precaution against infection. Where a foreign body has been embedded in the cornea for several days, the same guarded prognosis should be given, as it is more than probable that infection has taken place, rendering complications possible. It is to be remembered that infection is liable to occur from the impaction of any foreign body on the cornea, no matter how simple an injury it may

seem; therefore, to be on the safe side, it is well to always take advantage of all aseptic precautions against infection.

The removal of a foreign body from the cornea should always be preceded by thorough cleansing of the eyelids and surrounding parts. The eyelashes, particularly, should be freed of all foreign matter by vigorous wiping with pledgets of cotton dipped in 1-5000 bichloride solution. A few drops of a 1 per cent. sol. holocaine should now be instilled into the conjunctival sac and upon the cornea. Holocaine is preferable to cocaine because it is antiseptic, does not destroy the corneal epithelium, and does not dilate the pupil nor affect the accommodation. The conjunctival sac may now be flushed with a 1-5000 sol. bichloride, and the cornea wiped gently with a piece of cotton dipped in the same solution. The removal of the foreign body should first be attempted with a sharp-pointed toothpick, upon the end of which is tightly wound a very thin film of cotton wet with the bichloride solution. If the foreign body is loosely embedded and has sharp edges, it will be engaged in the meshes of the cotton and come away readily without falling into the conjunctival sac. The same cotton toothpick may be used to wipe out the indentation made by the foreign body, unless it is found that the site has a charred or blackened wall in which event a blunt foreign body spud should be used as a curette for the removal of the deposit. The eye should now be covered with a piece of cotton dipped in 1-5000 sol. bichloride, over this some dry cotton, the whole being held in place by two strips of isinglass plaster. This dressing should be removed in from twelve to twenty-four hours, when, if the cornea has not been too extensively wounded, healing will be found to have taken place. In event of its not having done so, a dry dressing should be substituted, or the eye kept closed until it has healed. Where we have to contend with an infected focus of inflammation about the foreign body, the same preliminary steps should be taken, the foreign body removed with a spud and the softened tissue about it removed with the same instrument. A toothpick should now be prepared as for the removal of a foreign body. This is dipped into pure carbolic acid, the excess removed by pressing it against a towel, and the infected spot cauterized. A drop of 1 per cent. sol. atropine is instilled into the eye, and the wet bichloride dressing ap-

plied. This dressing should be removed in twenty-four hours and replaced by a dry dressing, which is in turn changed every twenty-four hours until healing takes place. If the infected focus does not show a disposition to undergo resolution, nosophen should be dusted over it. The atropine should be continued at each dressing so long as there is ciliary congestion. I have frequently found it necessary, because of slight increase of the intra-ocular tension, to use a ¼ of 1 per cent. sol. eserine.

Where foreign bodies in the cornea are very small and very deeply embedded, a great deal of patience must be exercised. A sharp spud is often recommended for their removal, but I would recommend a blunt spud. It is infinitely safer, and I have yet to see a foreign body that I could not remove with it.

Where the infection has been extensive and the eye neglected, with resulting corneal ulceration or abscess formation with or without hypopion, or where ophthalmitis or panophthalmitis has set in, such processes are to be handled according to our usual methods. Their consideration is outside the scope of this paper.

I hope I have made my point clear, that while foreign bodies on the cornea are often very simple injuries, and, when removed, healing usually takes place in a few hours, still we as physicians are not justified in looking upon the condition in general as one unattended with danger. Therefore, so long as danger of possible infection is present, we should adopt such antiseptic precautions as would be carried out upon an equally simple injury upon any other part of the body. If we are called upon to dress a simple wound upon the body, we do it according to the latest aseptic methods. The layman often takes his chances with simple injuries, and does not consult a physician. When the physician is consulted he should guard himself by protecting the patient so far as it is possible. Patients rarely complain of excessive attention at any one visit.

DISCUSSION ON THE PAPERS OF DRS. BANE, JACKSON AND BLACK.

Dr. Bane—The subjects of foreign bodies on and within the eye have been fully and clearly presented by Drs. Jackson and Black. There is one point that, while it is understood, should

never be overlooked; that is, to always test and *record* the vision before removing a foreign body from an eye. This is important because we not infrequently find that the vision of an eye is defective when the patient was unaware of it. To treat such an eye, and the patient learning subsequently that the vision is defective, complaint may be made that the treatment damaged the vision, whereas the defect had previously existed. The record will protect the physician in such cases.

Dr. Black—Dr. Jackson's paper on foreign bodies in the eye is particularly applicable in Colorado because of the great number of injuries of this kind that we have to treat; the great number of injuries from mining explosions, from chips of steel flying from hammers and drills, which, by the way, are sometimes quite difficult of positively diagnosticating as steel because of flying particles of rock which may accompany such foreign bodies, rendering it hard to tell whether it is rock or steel which has penetrated. The multiplicity of these injuries makes this subject of great importance to us.

Within the last three months I had in one week two cases. One case I saw within twenty-four hours after the injury; in the other case the injury had taken place some six months previous to the time I saw it. The feature of these two cases was that they were both so similar in their appearance and in the way that the injuries happened. Both men injured were holding drills and received a piece of steel in the eye, probably from the hammer or drill. In each the foreign body penetrated the cornea, passed directly through the pupil without injuring the iris, and the penetration of the lens could be very plainly seen. The first one that I saw was the one that had taken place twenty-four hours before I saw it. In this case I advised strongly the use of a magnet. I made a small corneal section, performed an iridectomy, removed the lens and introduced the magnet through the coloboma. At the first introduction nothing came away. The magnet was introduced again in a different portion of the eye, not, presumably, where the foreign body was, and upon making connection of the circuit the foreign body came away. This eye was preserved, but with poor vision. The visual result was not good, but the cosmetic result was fairly good. The eye,

however, is certainly very much more useful than an artificial eye.

The other case, unfortunately, had waited too long. It exemplifies the need of early treatment. The foreign body had been incapsulated by inflammatory exudation. The same procedure was carried out as in the first case. The magnet could be felt plainly pulling upon the foreign body, but it could not be removed. It seemed to be in the region of the ciliary body, and I questioned the advisability of scooping and scraping around in this region, because the damage inflicted here would possibly cause sympathetic inflammation later on. I did not have the consent of the patient to enucleate at this time, but did later on, and the foreign body was found incapsulated in the ciliary region; it had passed through the cornea, the pupil and the lens and did not injure the iris. You can see that it made a very oblique entrance.

The paper of Dr. Bane's fully illustrates the possibility of scleral rupture when it would seem almost impossible to puncture it. You take an enucleated eye, hold it between your fingers and endeavor to drive a sharp instrument into it, and you will have great difficulty in so doing. This makes us wonder how it is possible to have it penetrated by blunt bodies. But it does happen and happens only too frequently.

THE RELATION OF DISEASES OF THE EAR TO THOSE OF THE NOSE AND THROAT.

BY JOHN M. FOSTER, M. D., DENVER.

It does not seem to have been fully impressed upon the medical mind the intimate relation and sequence existing between the pathological conditions of the nose and throat and that of the ear, or of the great number of cases that are readily and distinctly traced from their source in the pharyngeal cavity, along the Eustachian tube, to the ear. The question of cause and effect has not been properly considered by the profession at large, for we know that an acute or chronic catarrhal condi-

tion of the upper respiratory tract must be borne in mind as the probable starting point of an inflammation of the ear. Therefore we must not be tempted to give undue attention to the statements of the patient, or to any preconceived ideas that we may have acquired, as to the importance of influences working externally, that is, through the external auditory canal and drum head, such as the effects of cold wind, violent vibrations such as concussion, pressure of water, etc. These influences certainly do produce disease of the middle ear in a certain number of cases, but the percentage is small. This is readily accounted for when we remember the contrast in the anatomical conditions of the two parts, and remember that an inflammation has, to reach the ear from the throat, only to extend itself along the delicate, easily inflamed mucous membrane of the Eustachian tube that is continuous from the nose to the ear.

On the other hand, note the resistance offered to influences working externally. Here no mucous membrane is encountered to aid in carrying trouble, for, as you well know, the external layer of the drum-head is distinctly and positively cutaneous, and has none of the characteristics of a mucous membrane. Then, too, it is well supported against violence and shocks of all descriptions by the strong fibrous layer of the drum, and the safety valve, as it were, of the membrana flaccida that is supposed to mitigate the severity of shocks by yielding somewhat more upon their impingement. Therefore it can be readily seen that in a vast majority of cases the source of the inflammation is from the nose and throat and not from external causes.

Remembering these facts, it therefore seems patent that almost any form of inflammation that attacks the nose or pharynx may readily be transferred to the middle ear—not alone the catarrhal and purulent, but the graver forms, such as diphtheritic, etc.

When the middle ear once becomes inflamed we are confronted by a serious condition. Some cases are alarming and a few are fatal. Therefore I beg to call your attention to one or two subjects in direct connection here that should be more thoroughly appreciated by the profession at large, and through them impressed upon the laity.

As has been said before, most of the diseases of the middle ear originate from the nose and throat, and when the trouble has commenced it is a serious condition, for no man can say just what its termination will be. Therefore I want to protest in the first place against the too frequent scant attention paid by the average practitioner to earaches following coryza in children. It is a matter of surprise to note in how many instances it is thought of only sufficient import to require but the slightest attention. Frequently the child is entirely ignored by the doctor; or it is left in the care of and at the discretion of the mother, the nurse, or some other member of the household, who use whatever custom or their own ideas may suggest—whether it be a *hot* onion, a burning chicken feather under the nose, or what not. Gentlemen, these cases in an adult would demand your best attention and skill, for no one who has reached the age of discretion would submit to this often excruciating pain without at least taxing your utmost skill to procure relief. The pain and distress are not the only features that are of moment to us, for even after they are entirely eliminated the case often needs attention; for it is just these cases of neglected earaches that form the starting point of many forms of deafness that are gradually developed, and which yield but very imperfectly to even the best of treatment when too long delayed: I mean the chronic non-suppurative inflammations of the middle ear. These do not often cause a menace to life, but they surely lead on to inevitable deafness.

This is one of the outcomes of these cases, and I wish to touch very briefly upon another and a less fortunate ending; that is, in cases in which the membrane ruptures, giving away before a purulent corroding discharge. It is just here that skill and attention is demanded, and patience, too, is brought into requisition, for not all of these discharges are readily controlled. We can fully realize the danger when we call to mind the anatomical relations of the tympanic cavity, the readiness with which an ichorous corroding discharge can eat its way upward into the cranial cavity, downward into the great jugular, or inward into the labyrinth of the internal ear.

Then again the horror and disgust of a foetid, greenish, often putrid discharge from an ear! The fortunate cases are those that are accompanied by a cicatricial healing of the drum-head after allaying the discharge, but many cases do not readily yield, the discharge does not cease, and is a constant source of danger, as well as a blight and an offense.

It is on this subject that I wish to make my final remarks. Some years ago it was asserted that a running sore was not detrimental to health, but no one would think of believing such a statement now, at least medical men would not. Yet we often find that no special effort has been made to disabuse the mind of the laity on this subject, nor is it insisted upon or impressed upon their minds the absolute necessity of keeping these ears constantly and scrupulously clean, and that everything possible must be done to stop the discharge.

As these cases are so readily traced from the nose and throat it is well worth while to bear the relation in mind, and prevent and cure our cases by beginning at the starting point.

DISCUSSION.

Dr. Melville Black—I do not think the doctor dwelt sufficiently long upon the relation of diseases of the throat to the ear. I have never been thoroughly convinced that an inflammatory condition of the naso-pharynx travels directly by way of the eustachian tube to the ear. Bosworth, I believe, claims that in these cases where there is a diseased condition of the naso-pharynx of an acute character, inducing an inflammatory condition of the middle ear, the process does not travel directly by way of the tube; but that it is due to a closure of the pharyngeal end of the eustachian tube producing a rarification of air in the middle ear, exhausting, so to speak, all of the air or most of it, and thus producing such a suction upon this sensitive membrane as to finally excite an inflammatory condition. This is hard to believe, I will admit, inasmuch as we do not believe at the present time that we can have an inflammatory condition without the necessary germ infection; so that I myself have never been thoroughly satisfied which view is correct—whether it is due to an actual

traveling of the inflammatory condition by way of the mucous membrane to the middle ear directly, or whether it is due to the exhaustion of the air in the middle ear producing retraction of the drum head and a subacute inflammatory condition leading to an exudation in the middle ear wherein germs that might otherwise not cause trouble find a suitable soil for cultivation and we have an acute inflammatory condition resulting. However, the doctor has touched upon a very important subject in relation to the middle ear troubles, especially where we have them as sequelae to diphtheria and scarlet fever, and the very great importance and necessity of giving these particular organs prompt attention. We often save the child's life only to leave it partially or totally deaf. It probably would prefer to have ended its existence at that particular time rather than lead a life of complete deafness ever after.

Dr. W. P. Munn—The question of direct infection of the ear would seem to be pretty definitely settled by those cases of diphtheria which we formerly used to see, where a membrane extended by continuity from the pharynx through the eustachian tube and then, penetrating through the membrana tympani, was observable in the external auditory meatus. I should think that the appearance of such cases would definitely show that at least some instances of suppurative trouble of the middle ear are carried by direct infection traveling along the mucous membrane of the eustachian tube.

Dr. S. E. Solly—There is little doubt that the truth lies between the two. In an infectious disease such as diphtheria and probably also scarlet fever, the infection is a direct extension. In an ordinary acute inflammation of the naso-pharynx the occlusion of the eustachian tubes appears to be nature's way of preventing the extension of these germs of suppuration, so that if middle ear symptoms arise while the tubes are closed the treatment should be from the outside. Dr. Charles Burnett has recently pointed this out, decrying the use of Politzerisation because of the danger of spreading the disease from the naso-pharynx and advising the relief of the tension upon the membrane through the external meatus.

THE USE OF SALICIN IN THE TREATMENT OF ACUTE RHEUMATISM.

BY J. W. CLINE, M. D., GEORGETOWN.

There is probably no disease in which so many modes of treatment have been resorted to as in acute rheumatism, and there is none in which medical treatment, until very recently, has more completely failed to shorten the duration of the malady. Osler begins his treatise on the subject by saying that medicine has little or no control over the course of the disease. Wood and Fitz, Flint, Quain, Lockwood, Foster and others give a variety of treatments, but by the multiplicity simply acknowledge their inefficiency. Only in the last number of the Journal of the American Medical Association do I see, in the first article of that issue, a treatise on the subject of acute rheumatism, where the writer prefaces his discourse by the admission that he has no decided convictions as to the successful and satisfactory therapy.

Neither time nor the subject of my paper will permit me to enter into a thorough and systematic discussion of the subject of rheumatism. But in regard to theory I wish to say that I am a firm believer in the miasmatic theory, and believe all others, such as the neurotic, the uric acid, lactic acid theory, and others, to be simply obsolete.

The study and the conclusive proof of the miasmatic origin of rheumatism have led to its scientific treatment, and have shown the fallacy of all such treatments, even those so much in vogue at the present time, as the alkaline, antiphlogistic, dietetic, and diaphoresis; even of the salicylates as they are commonly used, and of all other forms of treatment save the one which is directed to the destruction of the fountain head of the disease—the miasma or poison which gives rise to the phenomena of acute rheumatism. This destruction of the poison is now accomplished by the use of salicin. Since learning what a wonderful agent we have in the cure of this disease, I should as soon think of treating ague without the use of quinine as I would of treating acute

rheumatism without the use of salicin. Salicylic acid, and its salt, sodium salicylate, are the two remedies probably most used at present in the treatment of rheumatism; but they are both depressing to the heart, and too much so to admit of their being given in sufficiently large doses to effectively destroy the poison of rheumatism. This is just where these agents failed, I believe, to fulfill the expectations entertained for them when first brought to the attention of the profession as the remedies for the treatment of rheumatism. They are handicapped, so to speak, in so depressing the heart that they must be withdrawn or reduced in dose before the system has become sufficiently saturated with the salicylic acid to neutralize or destroy the poison of rheumatism. Osler says that but ninety grains per diem of either salicylic acid or sodium salicylate can be given continuously with safety. Thus it is well known, as Osler admits, that such does not materially affect the course, and especially the duration, of the disease. With salicin it is different. It can be administered in large amounts without serious depressing effects. I say large amounts; this is important, for if you do not give large amounts you may almost as well not give any. The giving of an insufficient quantity is where I believe most practitioners have failed in the use of salicin. To begin giving to an adult fifteen or twenty grains of salicin every four or five hours is to do injustice both to the drug and to the patient. Give thirty grains every hour till pain lessens, and then every two hours till all pain, fever, and most of the swelling have disappeared. This you will find to occur sometimes in twelve hours, usually in twenty-four hours, and always in forty-eight if the drug is properly taken. You must get the system saturated with it just as rapidly as possible, and the sooner you accomplish this effect the better. The good results obtained from salicin are nothing less than marvelous, as the following cases will illustrate.

Case I. A young woman, age 21. Had rheumatism two years before, at which time she was confined to her bed six weeks. Examination revealed the following: Lies in bed scarcely able to move, both ankles, knees and wrists being the seat of severe pains, and greatly swollen, so that she can not bear to have them touched or moved. Temperature 102°, pulse 128, somewhat weak, and she had been perspiring some. I or-

dered her to have twenty-five grains of salicin each hour for four doses, then every two hours till pain stopped. This was at 4 p. m. On the following day I saw her, and found that pain, fever and swelling had all lessened very materially; she said that she was feeling much better. Ordered salicin continued as before every two hours. Second day I called I found patient sitting up; said she was all right now, "only that she had a bad ringing in her ears." Temperature was normal, pulse 98, pain and swelling all gone, some of joints just a little stiff. I urged her, however, to continue taking the powders three times a day for ten days. Did not see patient again till ten days later, when I was called again. Found that patient had been all right up to a day or two before, when she began to feel the pains returning in her joints, and she was now in even a more helpless condition than during previous attack. Knees, ankles and wrists all swollen and very painful, temperature 102°, pulse again very weak and rapid. Inquiry revealed that she had neglected to take any medicine after I last saw her. Ordered to have twenty-five grains salicin each hour for five doses, and then every two hours until I returned, and three times a day following for two weeks. Third day patient was again out of bed, and fourth felt as well as usual. This time she continued medicine as directed for two weeks, and thus far, for a year and a half, she has had no return of symptoms.

This not only illustrates the rapid action of salicin in relieving the symptoms of rheumatism, but it illustrates, as several similar cases have proved to me, that it is necessary to continue the administration for a number of days after all symptoms have subsided, in order, as it seems, to thoroughly eradicate the poison from the system, just as the administration of quinine is continued in ague even after the chills have ceased.

Salicin is very rapidly eliminated from the system, and consequently it must be given regularly in order for the system to become saturated with the drug. You will usually find that at about the time the ears begin to ring the pain lessens and the fever begins to fall. The following case will show the difference in effect when taken regularly and when not:

Case II. A man, age 33, telegraph operator. Never had had rheumatism before. Complained of very severe pain in lumbar

region and in thighs, which had just come on within the last couple of days. Pain was especially severe when he attempted to move, as to rise from a chair. Pulse and temperature normal. Diagnosis, lumbago or muscular rheumatism. Ordered to have thirty grains of salicin each hour for four doses, then every two hours till relieved. Following day saw patient, and he said he was no better; complained bitterly of the pain, especially when he tried to walk. I asked him if he had taken medicine regularly; he said no, that he had only gotten one or two doses through the night. Ordered him again to have thirty grains salicin every two hours, regularly. Saw patient again the third day; he said the pain was still just the same, and there was no ringing of the ears; he said, though, that he had slept most of the previous night, and having had no one to give him the medicine, he had not gotten it. Somewhat provoked, I told the patient to have his medicine regularly or I could no nothing for him. The fourth day I saw patient again, and all that he had to complain of was the severe ringing in his ears and some difficulty in hearing. He said he had taken the medicine regularly, that the pain was all gone, and he could walk about as well as usual. Continued salicin three times a day for ten days, and patient has had no return of malady.

It is a well established fact in practical therapeutics that a certain quantity of quinine, given at regular intervals with perhaps a maximum dose just before the chill, will soon control the symptoms of ague; the certain amount necessary to control the symptoms has become pretty well determined, and is familiar to nearly every practitioner. It is also known that a smaller amount, say one-half, is not sufficient to control the paroxysms. Thus it is seen that the system must to a certain extent become saturated with the quinine before the parasite or poison of ague is rendered inert. So it is with salicylic acid or sodium salicylate; with the doses that are generally considered safe the system does not become sufficiently saturated with the salicylic acid to render the parasite of rheumatism incapable of reproduction and of bringing on fresh paroxysms of the disease. They are also unquestionably depressing to the heart and unsafe to give in heroic doses in the majority of cases. One other case which I wish to report will show that salicin is comparatively safe, and

can be administered in heroic doses even where the heart is very weak; and also that it is imperative to so administer if you would get results from its use.

Case III. Italian laborer, age 41. Saw him first on Sunday, January 28. Had been sick for a week previous to my being called; lies in bed scarcely able to move any member of his body. Examination finds both ankles and left knee greatly swollen and very painful, so that he can not bear to have them touched or moved; wrists and elbow also painful; pain and swelling has been shifting from joint to joint; temperature 103°; has at times been sweating very profusely; tongue furred; pulse 140, very weak and irregular. Auscultation reveals a mitral murmur. Patient looked bad and his condition seemed serious. There appeared to be danger of heart failure at most any time. At that time, not having had so much experience with the use of salicin as I have had since, I had a hesitancy in putting this case on the large and frequent doses, fearing an increased depression to the heart which might prove fatal. Accordingly I tampered with the drug, ordering him to have eighteen grains of the salicin every four or five hours, together, of course, with heart stimulants. This was Sunday morning. Patient lived out of town, so that I could not see him every day, but I saw him again Tuesday. He had been having the salicin regularly, eighteen grains every four hours, but his condition was no better and semed even worse; he was scarcely able to move, his heart very weak and irregular, his temperature 103°, and he was delirious at times. The case seemed desperate, and I assured friends that there was danger of his death at any time. Up to this time there had been no ringing of the ears. I pushed heart stimulants and decided to give large and frequent doses of salicin. Accordingly I ordered him to have thirty grains of salicin each hour for four doses, then every two hours till I saw patient again. Thursday, the second day afterwards, I visited patient again and found him comparatively comfortable; pain was all gone, temperature nearly normal, swellings had mostly disappeared, pulse was 100 and stronger, and the patient was resting and feeling comparatively well, wanting to know if he could not get up in a day or two. Ordered salicin continued, by gradually decreasing the fre-

quency of dose, for ten days. Patient went on to complete recovery and has had no return of the disease.

In conclusion I wish to reiterate three points which I have endeavored to show and demonstrate in this brief discussion on the use of salicin in the treatment of acute rheumatism: First, that salicin must be given in large and frequent doses if you would get results from its use; second, that it is a comparatively safe remedy when so used; and third, that you will find salicin a specific, when properly administered, in the treatment of acute rheumatism.

DISCUSSION.

Dr. E. Stuver—I have been very much interested in the paper just read, and simply wish to refer to one point in connection with the administration of the salicylate of sodium and salicylic acid. The principal objection to the administration of salicylate of sodium is the digestive disturbance set up by the remedy in large doses, also the depression caused by its use. I have for a number of years been using salicylate of sodium in 15-grain doses given every two hours, and by combining it with three to five minims of the straight old fluid extract of cascara sagrada I have found that there is no stomach disturbance caused by using it in this way. The cascara acts as a tonic and a stimulant to the stomach; besides, from its well-known laxative action, helps to eliminate the poison of the rheumatism. Formerly I used the salicylate in doses of fifteen grains every two hours, and it would in almost every case cause a disturbance of the stomach that would prevent the use of it sufficiently long to produce the desired results. Since using it as indicated I have scarcely seen a case that required treatment for more than two or three days before the acute symptoms had subsided.

Dr. S. E. Solly—Mr. President: I was very much interested in the paper. I can not say that I have tried salicin in the large doses that the doctor recommends, therefore can not say what success I would have had. But his success seems to have been very much what we do get with salicylate of soda properly administered. He has had a relapse in one case and probably will have in others. It is doubtful how far the source

of disease is cut off. The disease is probably shortened, that is, it will run its course, but the symptoms will subside and the discomfort will disappear as soon as the swelling begins to subside; the patient thinks he is well but the rheumatism is not entirely cured. In the use of the salicylate I think it is very important to use the wintergreen preparation. It makes a great difference in the effect upon the stomach.

The depressing action on the heart, I think, has been very much exaggerated. I think that could be obviated by giving heart stimulants or tonics of the character appropriate to the case. And, again, in rheumatism due to a special microbe, we are apt to attach too much importance to the microbe itself and not enough to the soil on which it grows. A parasite grows upon a certain soil, and treatment consists not merely in destroying the parasite, but also in improving the condition of the system which led to the growth of that parasite. It is the same in malaria. Quinine does stop the chills of malaria, but it does not cure the patient entirely. Therefore there are other things to be considered, particularly the condition of the liver. Iodide of potash, etc., are of value. I have used salicin in considerable doses, but not as steadily as Dr. Cline has, and I have found it a very good remedy. It is a very good remedy in special complications. It is a very good remedy in diarrhea, and it is a valuable drug. It was Dr. MacLagan who first brought salicin forward and spoke so highly of it, and then the profession turned to salicylates, but they have never gone back to salicin as prescribed by Dr. MacLagan. My experience has been that as a rule the salicylates are more useful than salicin, but sometimes salicin is more useful than the salicylates.

Dr. J. T. Melvin—We may not all accept the theory of Dr. Cline as to the etiology of rheumatism. Still there can be no possible question as to the efficacy of the treatment the doctor advocates. Some twenty years ago the use of salicin in Boston was almost universal in all cases of rheumatism. It was used in very, very large quantities by the profession. About that time the salicylates were brought forward as substitutes, and, as Dr. Solly has said, they superseded the use of salicin, even among those who were formerly using salicin in those large doses. The reasons given at that time why the salicylates super-

seded the original salicin were that they had a more positive, prompt and efficient action, and the abandonment of salicin by the profession was a pretty fair proof that there were better agents. And I think our experience, each one of us, along that line has convinced us that the salicylates are in the majority of cases the more efficient remedies. But there are a number of cases, as Dr. Solly has just stated, where salicin will act as an alternative remedy and will not cause the digestive disturbance which has been alluded to—does not upset the general system, as the salicylates so often do. And I think there is one thing that we should bear in mind, and that is that we have something which we can alternate with the salicylates of almost identically the same constitution (being a glucoside which is decomposed by the system into salicylic acid), and yet one which will be adapted to a large number of cases where often our salicylates will fail.

Dr. H. B. Whitney—I just want to say a word in regard to the use of salicylates. I have not had any experience with salicin because, as a rule, the use of the salicylates has been perfectly satisfactory. I happen to have had a very large experience in rheumatism. In my services at the county hospital during the first four months of the year I am sorry to say that about 75 or 80 per cent. of all my cases there are rheumatic; hence I have had more experience with it than I have wished. As a rule it has seemed to me that the profession gives salicylates in too small doses, and I have adopted a suggestion made in Pepper's System of giving ten grains every hour in a cycle until twelve doses are given. It is then omitted for twelve hours. Then another cycle of twelve hours follows, during which ten grains are again given every hour, and then after another intermission of twelve hours, when the symptoms have pretty well subsided, the drug is administered six times a day. That is my routine at the county hospital.

I do not think there is the danger of depressing or weakening the heart by the use of salicylates that is usually spoken of. I have used it in these doses for a number of years—six or eight perhaps—in a very large number of cases, and I have never in a single case seen any unpleasant action of salicylates on the

heart. In my opinion this deletarious effect has been very much exaggerated. I have also found that where I cannot use the ordinary salicylates, that is, the salicylate of soda, where it disturbs the stomach, which is exceptional in my experience, the substitution of the salicylic acid made from the oil of wintergreen and dissolved by the addition of a little carbonate of potash has very excellent effects and is borne by most stomachs.

Dr. Cline—I would just say one word in regard to the effect of salicin and sodium salicylate on the stomach. While we all know that the salicylate of sodium does disagree with the stomach, I know that salicin does not. It seems to me oftentimes to be really a tonic, a stomachic. I have never yet had a case where it has at all disagreed with the stomach. I will grant that with the doses usually given of sodium salicylate and salicin, sodium salicylate will give the better result; but it is the large doses of salicin that give the results, and if you will give those large doses you will find it perfectly satisfactory in curing the disease, in a short time, given a fair case. I have found it to be true that sodium salicylate does depress the heart, while salicin does not seem to have that effect. It seems perfectly safe to give in every case. There are several other cases I could report which prove to me that it is a specific in the treatment of rheumatism when properly used.

SYMPOSIUM ON PNEUMONIA.

THE ETIOLOGY OF ACUTE DIFFUSE PNEUMONIA.

BY WM. N. BEGGS, A. B., M. D., DENVER.

Inasmuch as the consideration of the etiology of pneumonia is inseparably connected with its pathology, I shall first present the pathological classification which, to me, appears the most rational at the present time. We are, of course, familiar with the general classification of acute pneumonias into lobar and lobular or croupous and catarrhal, and I need not give their anatomical characteristics. We are also well aware that the terms lobar and croupous, and lobular and catarrhal, are not absolutely synonymous. While we have understood that as a general rule croupous pneumonia is lobar and lobar pneumonia croupous, and that catarrhal pneumonia is lobular and lobular pneumonia catarrhal, we have also, of course, known that this is not a rule without exceptions. Catarrhal pneumonia may involve an entire lobe, and croupous pneumonia may involve less than a lobe or may even have a lobular distribution.

Recently attempts have been made to attain a more exact classification of the pneumonias, and some confusion has arisen as to the exact characterization of some of the members of this group. Thus Aufrecht, in volume XIV, I. of Nothnagel's Specielle Pathologie und Therapie (just appeared), gives the following classification of the acute diffuse affections of the lungs.

a. Croupous pneumonia.
b. Catarrhal pneumonia (hitherto also called lobular pneumonia).
c. Atypical pneumonia (hitherto called infectious, bilious, or asthenic pneumonia, or pneumotyphus).
d. Hypostatic pneumonia.

e. Aspiration pneumonia.
f. Desquamative pneumonia.
g. Syphilitic pneumonia.

To this classification I shall devote considerable attention on account of the importance of the publication.

Disregarding the syphilitic affection, we see that he separates the atypical pneumonias from the croupous, and the hypostatic, aspiration and desquamative from the catarrhal with which they have generally been classed. Now they certainly do present some different characteristics from the typical paradigms of croupous and catarrhal pneumonias; there are a number of different bacteria forming the etiological factors; but it is just to question whether they are anatomically essentially different or not. If they are this classification is correct; if they are not, it is unjustifiable.

Some difficulty in arriving at a generally accepted classification seems to be due to the tendency on the part of some to exact a sharp differentiation between the different types of inflammation. That is, however, not always possible. Pathological processes overlap each other just as normal animal and vegetable varieties do. Therefore, in deciding upon a nomenclature, it is necessary to make use of the rule "de potiori denominatio fit"—the nomenclature is determined by the chief characteristics. For example, in an inflammation "escape of fluid on the surface of a mucous or serous membrane gives the picture of a serous catarrh. If the fluid is associated with marked mucoid change of the superficial epithelium and of the mucous glands there is a mucous catarrh. If a marked desquamation of the epithelium —with or without mucoid change—occurs, there is a desquamative catarrh, and it may occur not only in mucous membranes, but also in the respiratory parenchyma of the lungs, on serous surfaces, in the kidney tubules. If the deposition of fibrin, or coagulation, occurs in a liquid exudate there are formed fibrinous and sero-fibrinous exudates, which are also called croupous. They occur chiefly on the surface of serous or mucous membranes and in the lungs." (Ziegler.) Now these seem to be easily enough distinguishable one from the other, and they are, as a rule. However, we sometimes find more than one of these character-

istics associated and we may experience some difficulty in the classification. Thus we know that the coagulating exudate is, par excellence, the characteristic of the so-called croupous pneumonia, and the non-coagulating exudate that of the catarrhal pneumonia in its various forms. Nevertheless we may find exquisite examples of coagulative exudate in pneumonias which we could not possibly designate as croupous and which, on account of the predominating characteristics, we must call catarrhal (Orth).

Aufrecht, in his description of the pathological anatomy of the atypical pneumonias, gives a description coinciding with that of the atypical croupous pneumonias of other authors. He says, however: *"The essential difference between this kind of lobar affection and the lobar affection in croupous pneumonia consists in the absence of fibrin in the alveolar spaces throughout the entire course of the disease.** The beginning of the process, however, is perfectly identical in both cases." Orth, in describing these same atypical cases of fibrinous lobar pneumonia, says: "There are cases in which the amount of fibrin in the exudate is relatively less, and also the distension of the alveoli does not reach the highest degree. These are found principally in the old and decrepid; occur, however, frequently in children in which, *as a rule, the fibrinous pneumonia is not found in so exquisitely typical anatomical forms as in adults.*† Fibrinous pneumonia is not always spread over large portions of the lung, but there are also very circumscribed, even lobular fibrino-pneumonic foci; these may also be multiple, as occurs in the so-called wandering pneumonia." Stengel says: "There are wide variations, however, for, on the one hand, typical fibrinous pneumonia may occasionally appear as a more or less lobular disease (particularly in influenza), and, on the other hand, the process may spread from one part of the lung to another (pneumonia migrans)." Ritter, in the report of a small epidemic of pneumonia, seven cases affected, three fatally, gives (according to Aufrecht) the following as the pathological condition in the fatal cases: "There was in one case grayish-red lobular hepatization of the lungs, in the second gray-

* Meaning strictly that caused by the Fraenkel-Weichselbaum pneumococcus.
† Italics mine.

ish-red sero-croupous hepatization of the lungs. In many places the macroscopical appearances corresponded rather with those of a catarrhal pneumonia, but nevertheless the microscopical examination showed, as in both the other cases, that it was a case of flaccid croupous pneumonia." According to Leichtenstern, "all these atypical pneumonias are only varieties of the endemic-epidemic pneumonia." In prebacterial times, however, he regarded them as decidedly different and separate diseases.

In a similar manner Aufrecht, not finding in aspiration pneumonia, hypostatic pneumonia, and desquamative pneumonia certain of the anatomical characteristics, especially one which he finds in the typical catarrhal pneumonia of early life, excludes them entirely from the class of catarrhal pneumonias; this, too, notwithstanding the fact that one of them especially (the aspiration pneumonia) has been almost universally regarded as a typical form of catarrhal inflammation. He says that the "gross anatomical characteristics must be regarded as the sole cause for the identification of these two processes. In this, however, the differences in the etiological factors and, what is dependent thereon, the different classes of the individuals affected—catarrhal pneumonia generally affects children—also the difference in the course and outcome of the two affections have been entirely overlooked." It is justifiable to remark, however, that the conception of catarrhal inflammation as such is absolutely independent of the etiological factors and the age or other characteristics of the individuals affected, but is just as entirely dependent upon the pathological anatomical characteristics, the characteristics of the exudate and its relations to the deeper tissues. Furthermore, dependent upon the characteristics of the exudate, whether serous, mucous, or desquamative catarrhal, there will be variations in the course and results of the different types, but one variety can not be regarded as more or less typical than the others.

For this reason one criterium, upon which he specially and absolutely insists, viz., "*an inflammatory hyperaemia, progressing even to hemorrhage of the capillary terminations of the arteries in the walls of the finest bronchial branches*," may be quite typical and uniformly found in the one variety of catarrhal pneumonia, that

of young children, as indicative of the severity of the bronchial participation in the inflammatory process; but its absence from the other varieties is not sufficient to exclude them from the general class, especially if they have the other characteristics of catarrhal inflammation. In other words, this one criterium may be diagnostic of the one particular variety of catarrhal pneumonia, but not of the class; just as the ruffle is characteristic of the jacobin pigeon, but we would hardly think of asserting that a bird could not be a pigeon if the ruffle were lacking.

Furthermore he gives as characteristics of catarrhal pneumonia: 1, The primary process, from which the rest is necessitated, occurs in the bronchi and extends from these to the surrounding tissues, the alveoli, which are secondarily involved; 2, the inflammation reaches the inner surface from without.* These he does not find in aspiration pneumonia. His own description of the histological conditions, however, carries the earmarks of a catarrhal inflammation. In a case of aspiration pneumonia he found the alveoli almost completely filled with cellular elements corresponding to the alveolar epithelium. The nuclei were usually not visible, when visible did not stain. Occasionally two to three nuclei were present in the cell. Fibrin was only scantily present in the alveoli. The alveolar capillaries were generally considerably hyperaemic. In another case of cerebral injury and the aspiration of water he found on microscopical examination large groups of alveoli completely filled with white blood corpuscles, among which red blood corpuscles were scattered. The interalveolar capillaries were distended with blood. The alveoli surrounding these groups contained almost exclusively red blood corpuscles. Only scattering remains of alveolar epithelium were visible. In a case of aspiration pneumonia from carbolic acid poisoning there was in the left lung a great number of small infiltrative foci in which a central and two surrounding zones could always be distinguished. The central zone included two to twenty alveoli. They were completely filled with white blood corpuscles. If epithelial cells were present they were anuclear. In many the changes were further advanced. Leucocytes were no longer distinguishable, but the whole was

*While these are very universally true, they are not accepted by pathologists as absolute criteria.

transformed into a structureless, coagulated mass and was separated from the middle zone. In the latter the alveoli were also filled, but chiefly with red blood corpuscles between which there were epithelial cells. White blood corpuscles were sparse. In the outer zone the alveoli contained fibrin, enclosing in its network swollen alveolar epithelium.

All these present certain common characteristics. There was inflammation having its seat in alveoli about isolated bronchioles. The tissues were affected in different degrees of severity. In the mildest degree there was inflammatory hyperaemia with superficial epithelial desquamation. In the next degree there was inflammatory hyperaemia with superficial epithelial desquamation and purulent catarrhal exudate* In the severest cases the central portion is necrotic, having been directly destroyed by the morbific agent,† but it is surrounded by the same interalveolar hyperaemia, epithelial desquamation and purulent catarrhal exudate. Further out, where the morbific agent acts less intensely chemotactically, there is a fibrinous exudate. It is simply to be remembered that in a purulent catarrhal exudate, although it is highly albuminous, spontaneous coagulation is prevented by the presence of the large number of leucocytes.

As regards hypostatic pneumonia he speaks as follows: "As regards its pathogenetic relationship the disease has its origin in an insufficiency in function of the vessels, or rather the vessel walls, which results in a stagnation of the blood, the injurious effects of which must be produced in the deepest part of the lungs. *The consequence of this stagnation is an insufficient nutrition of the pulmonary tissue, primarily the alveolar epithelium,* in which the nutritional disturbance results in a necrobiotic process. If this is brought about rapidly there results simply a destruction of the epithelium by a coagulation necrosis; if the process occurs more slowly an inflammatory irritation is exerted by the epithelium on the vessels and the exudation of blood corpuscles as

*"It is much more probable that *the inflammatory circulatory disturbance is a result of the primary tissue lesion.* Therefore necrosis and inflammation are often found alongside each other, corresponding to the different degrees of the injurious influence (e. g., a corrosion). From this there now result all gradations in the degree of the inflammatory injury" (Birch-Hirschfeld.)

†"The necrosis of the tissue may appear immediately, as the first effect of the injurious action, while the inflammatory exudation only takes place later, and is confined to the region adjoining the necrosis, and this occurs especially after the action of caustic substances, after exposure to a high temperature, and in ischaemia." (Ziegler.)

well as fibrin, also in smaller foci the exudation of leucocytes follows.* *Therefore in hypostatic pneumonia the process is not to be regarded as an essentially inflammatory one.* It is only later, when, the nutritional disturbance being not too far advanced in the alveolar epithelium, these exert an irritation in the alveolar walls, especially the alveolar capillaries, that inflammatory changes occur which correspond with those of croupous pneumonia, but far inferior in intensity and extent." It is true that not every hypostatic congestion becomes a hypostatic inflammation, just as it is true that not every active hyperaemia becomes an inflammation, but such cases are not under consideration.

As regards the inflammatory nature of the process, that is a matter of opinion depending on one's conception as to what inflammation is. Ziegler's definition, which is now probably the most generally accepted, is that "Inflammation is essentially a local tissue degeneration combined with pathological exudations from the blood-vessels, caused by some injurious agency, with which are associated, sometimes earlier, sometimes later, tissue proliferations leading to regeneration or hypertrophy." He further says, "Moreover, substances that excite inflammation can develop in the organism even without the aid of parasites; for example, if tissues die in large mass from any cause."

As regards the croupous or catarrhal nature of the process, "This form of catarrhal pneumonia occurs most frequently in hypostatic pulmonary tissue. The broncho-pneumonic character of the affection is less outspoken; more frequently extensive infiltrations occur which present mixed forms of catarrhal and fibrinous pneumonia." (Orth.) Ziegler says that "Broncho-pneumonias occur extraordinarily frequently in portions of the lungs which, toward the end of life, are the seat of stagnation or hypostatic hyperaemia and a haemorrhagic stagnation oedema."

Desquamative pneumonia has long been dignified with special descriptions in the text-books, being quite generally recognized, however, as a variety of catarrhal pneumonia.

*It must be remembered that bacteria are not to be entirely excluded from all etiological relationship with hypostatic pneumonia.

From the foregoing, not regarding the syphilitic pneumonia, I should, at the present day, prefer to classify the acute diffuse pneumonias as follows:

1. Croupous pneumonia.
    a. Typical.
    b. Atypical.
2. Catarrhal pneumonia.
    a. Typical.
    b. Hypostatic.
    c. Aspiration.
    d. Desquamative.

ETIOLOGY.

As a general rule it may be said that the direct cause of either of the foregoing types of pneumonia is to be found among the pathogenic bacteria, although the irritation of chemically irritant gases or the aspiration of chemically irritant liquids may produce catarrhal pneumonia without any bacterial agency being demonstrable.

A striking characteristic is the number of microörganisms which have the power of producing pneumonias. While the diplococcus lanceolatus of Fraenkel-Weichselbaum is by some regarded as the exclusive bacterial cause of the typical croupous pneumonia, it is generally acknowledged that this disease may be produced by a number of others, among them Friedlaender's bacillus pneumoniae, the streptococcus, etc. The same holds true of catarrhal pneumonia. From this we are justified in concluding that in neither can we assert a strict specificity of disease.

When we consider the individual bacteria we are met with a like lack of specificity of their pathological results. Thus the streptococcus lanceolatus of Fraenkel-Weichselbaum is unquestionably a very frequent (according to some probably the sole) cause of typical croupous pneumonia,* a very frequent (in about 50% the sole) cause of catarrhal pneumonia, pleurisy, endocarditis, peritonitis, meningitis, and ulcus serpens corneae, and an occasional cause of nephritis and perinephritis,

*This, the general view, is not undisputed. Leichtenstern says that even now the apparently most certain establishment of the causal agency of the streptococcus lanceolatus is not as firmly founded as is most generally accepted.

metritis, pyosalpinx, strumitis, parotitis, amygdalitis, arthritis, osteomyelitis, periostitis, and abscesses. Some regard it as identical with the streptococcus intracellularis found in cerebro-spinal meningitis. In animals some of the foregoing affections may be produced, but it usually gives rise to septicaemia. Therefore it may be readily seen that it has no specific pathogenetic effect either as to locality or tissue affected or the anatomical result, in one case giving rise to a croupous inflammation, in another to catarrhal, in a third to phlegmonous. It would seem that the organ to be effected is the one having the greatest predisposition at the time of infection. This microörganism is found generally intracellularly, but also extracellularly at the site of affection. It may also be found in the blood and sometimes in the urine and milk of the affected patients. In cases of pneumonia it is to be found in the sputum, thereby rendering microscopic examination an aid in diagnosis. It has been observed in the normal lungs and in the secretion of bronchitics. It is estimated that it occurs in the oral cavities of about 30% of all human beings. To this point I shall revert later.

The bacterium pneumoniae of Friedlaender is doubtless the cause of a small percentage of the cases of croupous pneumonia. It can likewise produce catarrhal pneumonia, bronchitis, and is occasionally found in various kinds of inflammations in different organs. It also sometimes gives rise to pyaemia and septicaemia.

The multiplicity of organs affected and of forms of inflammation produced by the streptococcus pyogenes is so well known as to render any further expatiation on the subject unnecessary. Suffice it to say that a considerable percentage of cases of catarrhal pneumonia, especially those complicating diphtheria, owe their origin to it, and that in croupous pneumonias it occurs specially in the atypical varieties.

What was said of the streptococcus pyogenes as regards the great number of pathological processes produced by it holds true also of the staphylococcus pyogenes aureus. It may give rise to purulent, catarrhal, or fibrinous inflammations of the most varied organs. It may occur as the cause of either catarrhal or croupous pneumonia.

The bacterium coli commune, as well as leading an apparently harmless existence in the intestinal tract of all human beings, may give rise to exceedingly serious inflammations of the most varied sorts. It causes peritonitis, nephritis, pyelonephritis, perinephritis, cystitis, and urethritis. To it have also been ascribed dysenteries and cholera nostras as well as puerperal fever. Of course it can not leave the lungs alone, and has been observed in lobar pneumonia (Kreibich), croupous pneumonia (Klein, Moeller) and in asthenic pneumonia (Aufrecht).

The tubercle bacillus, in addition to producing the characteristic neoplastic growth, the tubercle, in the most varied tissues and organs, has the power also of producing more diffuse and acute inflammations, either fibrinous or catarrhal. Thus many cases of pleurisy, either dry or with serous exudate, are due to the tubercle bacillus. Also there is always catarrhal, usually desquamative, pneumonia in the immediate neighborhood of tubercles in the lungs. This may be so extensive as to become lobar, and clinically it may be very difficult or even impossible to distinguish this affection from genuine typical croupous pneumonia.

The bacterium typhi may itself be the cause of many and varied complications of typhoid fever. Thus it may be the sole cause of serous or purulent inflammations of the brain or cord or their membranes. It may also occur alone in inflammations of various organs. It is capable of producing the different types of inflammation, catarrhal, purulent, or fibrinous. Some cases of croupous pneumonia in typhoid patients are due to the typhoid fever bacillus alone. Usually, however, they are complications, the streptococcus lanceolatus being the most common exciting cause.

The bacillus influenzae may produce the most varied pathological brood. It is the direct cause of numerous polymorphous affections of the nervous system, as polyneuritis, acute haemorrhagic encephalitis, purulent meningitis, etc. It also causes haemorrhagic gastritis, the most intense inflammations of the bronchial mucous membranes, and a whole host of other pathological conditions. The most frequent and the most important complication of influenza is pneumonia. For a time these pneumonias

were regarded as invariably complications due to other micro-organisms. Now it is generally recognized that in many cases the pneumonia is not a complication, but an expression of the disease. There is still a difference of opinion as to the anatomical nature of these influenza pneumonias. According to Aufrecht and Beck they are all catarrhal. Heitler says that many cases of croupous pneumonia are the direct result of the influenza producer. Leichtenstern asserts that four varieties of pneumonia, fibrinous, catarrhal, mixed and desquamative, may be directly caused by the influenza bacillus.

Bacillus psittacosis (Nocard) has been observed in a number of cases of atypical pneumonia in which the history pointed to direct infection from parrots.

Very infrequent causes of catarrhal pneumonia are the bacillus anthracis and the bacillus mallei. Aufrecht reports a case in which he found only the bacillus subtilis.

It is certain that other microörganisms, as yet unknown, may produce catarrhal pneumonia. Thus the catarrhal pneumonias occurring in the various exanthemata are many of them doubtless produced by the specific organism of the given primary disease. It is also exceedingly probable that there are yet many varieties of bacteria yet to be discovered as the etiological factors in many of the atypical croupous pneumonias.

In the foregoing brief mention of the more prominent germs concerned in the production of pneumonia, it has not been the purpose to describe their morphological characteristics, as they are already well known: I have rather desired to call attention to a few points in the pathogenesis of the disease. In the first place their great number certainly effectually disposes of the conception of either catarrhal or croupous pneumonia being morbid entities. It makes something more than an anatomical diagnosis of the disease necessary. It is essential to turn our attention to etiological diagnosis if we are to expect our bacteriological knowledge to have any therapeutic value in the future; and that finally is the test which must be applied to determine our advances in the line of practical medicine.

Again, the number of organs which may be affected by the various pathogenic agencies shows a lack of specificity as re-

gards the selection of tissues or structures to be affected. Whether the lung, or the kidney, or some part of the nervous system, or some portion of the digestive or genito-urinary tracts is to be the seat of disease is in some cases dependent upon the portal of invasion, in other cases is utterly independent of the portal of invasion and the microörganism in question, but dependent upon a temporary or permanent vulnerability of the particular organ due to entirely independent (predisposing) factors. It is the *susceptible* organ or tissue, the one which is below par, that is affected. If it happens to be a lung, a pneumonia is the result. It might just as well have been a meningitis or an endocarditis.

Furthermore, one and the same microörganism may produce different types of inflammation—catarrhal, purulent, croupous; there is therefore a lack of specificity of action. We naturally ask what is the factor which determines whether infection of a susceptible lung by the streptococcus lanceolatus, for example, will give a croupous or catarrhal pneumonia; or, if it be the tubercle bacillus in question whether it will result in the neoplastic growth—the tubercle—or in a lobular catarrhal or lobar desquamative pneumonia. This is probably to be answered by the method of invasion and the number of bacteria invading at a given time, together with the rapidity of their proliferation or, what is equivalent, the amount of toxines affecting the tissue elements, whether produced slowly and in small quantities or rapidly and in considerable concentration.

PREDISPOSING CAUSES.

I have already mentioned the fact that the streptococcus lanceolatus is found in the oral cavities of about 30% of human beings. To a greater or less extent the same is true of the other pathogenic germs mentioned. At various times we all inhale greater or less numbers of the streptococcus lanceolatus, bacterium pneumoniae, streptococcus pyogenes, bacterium influenzae, bacillus tuberculosis, etc. In other words, we are all carrying around with us our own sources of infection. Why do we not then all suffer from pneumonia and the great list of infectious diseases?

We need but call to mind the parable of the sower to have our reply: "A sower went forth to sow; and when he sowed, some seeds fell by the wayside, and the fowls came and devoured them up; some fell upon stony places, where they had not much earth; and forthwith they sprung up because they had no depth of earth; and when the sun was up they were scorched; and because they had no root they withered away * * * but others fell into good ground and brought forth fruit, some an hundred fold, some sixty fold, some thirty fold. Who hath ears to hear let him hear."

In addition to the exciting germ there must be a condition of the individual organism which will permit the proliferation of the germ and the production of the toxines. It would seem a piece of supererogation to allude to this were it not that even to this day we find appearing in the medical literature articles in which that is the burden of the objections to the germ theory of disease and the stumbling block to its acceptance by some members of the profession of more or less—usually less—prominence.

Fortunately for the human race, its individuals have a considerable power of resistance to the deleterious agencies acting upon them from all sides and at all times. This power of resistance is not an absolute one, but one of degree. We can readily recognize that any injurious agency—bacterial, chemical, thermal, mechanical—may be brought to bear upon the strongest individual in such degree as to bring about his destruction. Ordinarily, however, these influences are brought to bear in less degree, and among many individuals exposed to the same injurious influences some succumb, many more escape with less or no harm at all. We are thus compelled to recognize a variation in the power of resistance—in the degree of immunity, and therefore also of its opposite, susceptibility, to disease. Even those who persistently refuse to permit the recognition of its influence in controversies about the germ theory of disease freely acknowledge it in the non-infectious diseases.

This predisposition may be temporary, may vary from time to time, and is affected by the most varied agencies. Those which tend to increase it we call predisposing causes of disease.

Individual predisposition is of greater importance in the production of pneumonia than in the case of other infectious diseases generally, and the period of special predisposition may be very short. The predisposing causes may be inherent in the individual or may be extraneous.

Taking up first those inherent in the individual we have to consider race, sex, age and psychic disturbances.

Race has great influence on the frequency of the development of croupous pneumonia. Thus we find that negroes, as a rule, are specially susceptible. Again, while there is little difference in the occurrence of pneumonia in various latitudes, still those peoples who have been raised in rigorous climates, when they emigrate to more equable zones, do not as readily contract pneumonia as the natives; while, on the contrary, those migrating from a more equable to a more rigorous climate are specially apt to succumb to the disease.

It is very questionable whether sex, per se, has any direct influence. Fermi and Montesano say that the number of pneumonic cases in the hospitals, and probably in the general population, is much greater among men than among women; that absolutely more men, but relatively more women die of pneumonia. However, there are also other influences to be borne in mind. Men are, in general, much more exposed to the other predisposing causes, and it is these which probably cause the difference between the two sexes in morbidity. This seems to be borne out by the fact that it has been observed in several instances in which women led approximately the same kind of life, did the same work, and were exposed to the same influences as the men, that the morbidity was about the same.

Pneumonia may occur at any age. It has been observed in intra-uterine life, in the new-born, in children, in adult life, in old age. In the case of croupous pneumonia there seems to be little difference in the rate of morbidity for the decades from ten to sixty years of age. It is about twice as frequent from the fifth to the tenth year, and there is a great increase in frequency above the sixtieth year. Atypical, flabby croupous pneumonia occurs chiefly in the aged; but it often occurs also in children, among which, in general, the fibrinous pneumonia is not

found in such typical forms as in adults. Catarrhal pneumonia occurs with by far the greatest frequency in early childhood. It also, especially in the hypostatic form, occurs in the aged. Between these extremes it is rare, and then generally as the result of influenza.

It has been noticed that psychic conditions have some influence in the production of either form (croupous or catarrhal) of pneumonia. Anger, anxiety and especially mental depression favor its development.

Of the extraneous agencies exposure has always been regarded as one of the most important, and its importance must be recognized now not less than formerly. Direct exposure to inclemencies (wet, wind, variable temperature, etc.) has more effect than the general effect of these climatic elements. Thus, those whose work is in the open air are some two and one-half times more frequently affected by croupous pneumonia than those working in rooms. Then, too, a very considerable number of cases are explicitly referred by the patient to such direct exposure. Nevertheless these have also a general effect, as will be mentioned in the consideration of climatic conditions.

Scarcely less important than direct exposure to inclement weather in the production of croupous pneumonia is the influence of excessive or unusual bodily work. This is especially the case if the work results in muscular exhaustion and increased perspiration, particularly if there be coincident carelessness in cooling off. Habitual over-fatigue is also one of the important factors in the production of catarrhal pneumonia.

The inhalation of irritant gases is an important etiological element in the production of catarrhal pneumonia, especially in children. It may have this effect even without the presence of pathogenic bacteria; usually, however, they are associated with it. In this connection the frequent occurrence of aspiration pneumonia as the result of using ether as an anaesthetic must be borne in mind. The inhalation of irritant gases seems to have no effect in the production of croupous pneumonia.

A certain small and very variable percentage of cases of croupous pneumonia has been referred to traumatism. A noteworthy fact is that, as is also the case in cerebral injuries, the lesion need not occur on the same side as the traumatism.

Croupous pneumonia is a frequent complication of typhoid fever, typhus, puerperal fever, intermittent fever, influenza, and other infectious diseases. In some of these it is simply a complication. In others it is occasionally to be regarded as an expression of the effect of the specific germ of the disease itself. It is also a not rare complication of tuberculosis. In children, rickets and scrofula especially predispose to catarrhal pneumonia. In them, too, this form frequently occurs in connection with various infectious diseases, as measles, whooping cough, and diphtheria. In measles it may be a sequela or may be an accompaniment and manifestation of the disease. There may be even a rubeolar catarrhal pneumonia without the exanthem developing. Catarrhal pneumonia may also complicate burns and prolonged diarrhoeal and dysenteric affections. In adults perhaps the most frequent cause of catarrhal pneumonia is influenza, with which it very frequently occurs. In all cases of tuberculosis it is to be expected at some time and in varying extent. In the aged the hypostatic form is very apt to occur in the prolonged infectious diseases or any affection producing weakness of the heart or vascular system. Desquamative pneumonia may be secondary to measles, scarlatina, pertussis, influenza, tuberculosis, and other infectious diseases.

As regards the effects of social condition in the production of croupous pneumonia, very little positive data are to be had, but the general belief is that it is less frequently met among the better classes. Catarrhal pneumonia is certainly more common among the poor. The poor nutrition, bad ventilation, and unhygienic surroundings of the lower classes, with their consequent scrofula and rickets, make cachectic pneumonia far from rare among them, while it is scarcely known among the better classes. When it is found among the latter, especially if the children are a little advanced in age, syphilis may be suspected as an etiological factor.

As regards locality, any form of pneumonia may occur anywhere. There is no place free from the disease. However, there are temporary variations in the morbidity of different localities, even not far removed from each other.

Climate has no special influence on the frequency of the disease (Hirsch). Fermi and Montesano, in their investigations,

were not able to determine that any of the single components of the weather had any definite effect, and so varied and even diametrically opposed are the opinions of the different observers as to the effects of the various elemental combinations that no positive conclusion is justifiable.

There seems to be a uniformity of opinion that there is a direct relationship between the time of year and the frequency of the occurrence of pneumonia, also that the period of greater frequency changes from year to year. In a general way it may be said that the more irregular and changeable the weather the greater the development of pneumonias, especially if this is combined with a mean low temperature. Rapid variations in temperature, not only from day to day but at different hours in the day, especially great variation between the day and night temperatures, are of great importance. Winds also have a marked effect in the production of the disease, but the direction of the winds is of no consequence. In different latitudes the period of the year during which pneumonias occur with maximum frequency varies according to the greatest temperature variations. Thus, in the higher latitudes both are found in the spring, in the warmer regions in the winter.

VARIETIES OF PNEUMONIA.

BY J. N. HALL, M. D., DENVER.

Since the consideration of the etiology of the disease we are to discuss has been assigned to another, I shall speak but briefly of its bacteriology.

It is but a few years since pneumonia was generally looked upon as being an entirely definite disease. At present we rather consider it to be an inflammation of the lung due to any one of several species of micro-organisms, or to mechanical irritants, and varying within very wide limits in its nature, its duration and its prognosis.

The typical pneumonia is certainly the variety found so commonly in robust adults, often after exposure to cold, and

generally in association with Fraenkel's pneumococcus. But almost certainly other organisms may cause a croupous exudate in the lung. It is beyond question that they are frequently present in such exudates. It seems at present improbable that any croupous pneumonia exists apart from bacterial action of some kind. Exposure, cold and traumatism probably act only by favoring the development of the germs, of whatever kind, to the action of which the fibrinous alveolar exudate is attributable.

Thus Frank has mentioned that, although thousands died of cold during the Napoleonic retreat from Russia, pneumonia did not appear as a cause of death. It is evident that some cause was lacking, undoubtedly the microbial one.

Platini, in 1890, found that inhalation of the pneumococcus failed to cause pneumonia, but after traumatism of the chest wall infection took place.

I have seen a typical case of acute lobar pneumonia follow injury to the side. The sequence here is undoubtedly the same as in the occasional cases in which tuberculosis develops after an injury to the chest, namely, the infective organisms find an opportunity for growth in the damaged tissues.

I have no experience with the so-called malarial form of pneumonia, but in those who have suffered from ague, living in malarial regions, there is said to be a variety of this disease in which, with the paroxysms of a regular quotidian or tertian fever, are found pain in the side and the usual physical signs of pneumonia. These are especially frequent in the left lower lobe, it is stated by Eichhorst, but may reappear in a new spot with each chill.

I have no knowledge of any disease properly called rheumatic pneumonia.

The term "bilious pneumonia" apparently designates those cases in which slight jaundice appears, and in which the right lower lobe is most frequently involved. It has no further significance, I believe.

Those cases which from great virulence of the causative organism or feeble resistance on the part of the system of the person affected pursue a rapidly fatal course, are termed malignant.

I am not aware that there is any special bacteriological feature noted in these cases aside from the virulence mentioned.

There can be no question of the occurrence of cases of larval —perhaps more properly called abortive—pneumonia. In these cases no progress is made beyond the initial congestion. I have elsewhere recorded a case in which the temperature rose to 105.9 degrees, with pain, dullness, cough and the other signs and symptoms of pneumonia, in which the temperature was normal within forty-eight hours and convalescence was fully established. Of course no fully formed croupous exudate existed in this case, for the physical signs cleared up with the fall of the temperature. These cases are said to be especially frequent during the epidemics of pneumonia, of which we shall speak shortly.

Epidemics of this disease occur chiefly under conditions of over-crowding and bad hygiene. Many such have been reported from barracks and prisons, generally of rather severe character. Rodman, Munn and others have observed them. I have myself seen two instances of the occurrence of three cases in a family consecutively, and even eight or ten cases in one house have been noted by other observers. Such reports greatly strengthen the position of those who regard the disease as of bacterial origin. Suppurative complications are probably oftener observed in the epidemic pneumonia than usual.

Pneumonia with delayed resolution is probably not worthy of a place as a distinct variety of the disease. In one of my cases, a boy of seventeen years six weeks after his initial symptoms still had dullness and bronchial respiration over the left lower lobe, although complete recovery ensued. It has been stated that the streptococcus is the causative agent in these cases.

In the aged and feeble it is not uncommon to see a very low temperature curve, but I have not observed a really afebrile pneumonia, although they are occasionally reported.

It is not very uncommon to see cases in which the physical signs of pneumonia are delayed for several days beyond the time when we should expect them, judging from the symptoms. In several such cases I have eventually recognized a central pneumonia slowly spreading to the surface, but in others I have

been unable to account for the condition excepting by the supposition that the croupous deposit was later in forming than usual. I have not noted any unusual severity in cases of this variety.

Creeping or migratory pneumonia is not uncommon. In a recent case, seen with Dr. Packard, no permanent fall in temperature occurred for about eighteen days, adjoining portions of the lung being successively involved, but with eventual recovery. It has been stated that in these cases the pneumococcus is less constantly found than in others, but I do not know of any definite conclusion regarding this point. In similar cases, associated with or preceded by facial erysipelas, the streptococcus has been found.

The broncho-pneumonia due to the bacillus tuberculosis I shall not mention here, since it is better considered under the general subject of tuberculosis. The ordinary form, seen most frequently after hooping cough and measles, but not infrequently after diphtheria, influenza, typhoid fever, scarlet fever, smallpox and even German measles, and occasionally after dysentery and erysipelas, is not as strictly confined to infancy and old age as I was taught to believe. A number of well marked cases in apparently strong adults have fallen under my notice. In one young man of 23 years a typical broncho-pneumonia, limited to the right lung below the scapula, followed a general bronchitis of the larger tubes and was in turn followed by a slowly advancing tuberculosis. In this case it is difficult to say whether the broncho-pneumonia was originally of a tuberculous nature or not, although I believe that it was.

The pneumonia so common with our recent epidemics of influenza was often lobular, but more often distinctly lobar. Its well known fatality need only be mentioned.

Aspiration pneumonia is due beyond question to bacterial infection by means of buccal and pharyngeal secretions and food. A recovery in a case which I once saw, in which an attendant introduced the feeding tube into the trachea in an insane woman, and in which the milk thereby administered caused the severest cyanosis and general depression with abundant fine rales and moderate dullness over both bases, demonstrates to me that the

prognosis is not necessarily as bad as it is generally thought to be. It is probable that the milk in this case was comparatively less noxious than masticated food would have been.

A sharp distinction must be drawn between acute pneumonia of the adynamic form, often called typhoid pneumonia, but without any real typhoid complication; the so-called pneumo-typhus in which typhoid fever starts with a real pneumonia, the latter feature dominating the situation for the first week; the complicating lobar pneumonia of the middle period of typhoid fever; and the hypostatic pneumonia of the later weeks. The conditions need not be discussed here further than to say that our nomenclature is less exact than it should be.

Almost all cases of acute pneumonia are in reality cases of pleuro-pneumonia, but the plural complication is not commonly of any great importance.

Interstitial pneumonia is of especial interest to physicians in this state because of the great number of men employed in mining, handling stone, and other industries involving exposure to mineral dust. The important features of this form of most interest to us are, I believe, its not uncommon association with emphysema because of the great altitude at which many miners work, and its proneness to tubercular infection as a terminal event.

I believe that we shall eventually conclude that the great variability in the manifestations of inflammation of the lung is to be chiefly explained by the fact that atypical forms are due, not to the pneumococcus alone, but to the presence of various other micro-organisms with the pneumococcus, or alone, or in various combinations. The presence of the typhoid bacillus in the pneumonia of typhoid, of the streptococcus in pneumonia following erysipelas, of the influenza bacillus in grippal pneumonia, of the staphylococcus aureus in certain epidemics, and of various combinations of these germs and others in certain cases is certainly very suggestive.

DISCUSSION.

Dr. C. B. Van Zant—I derived much pleasure from listening to the admirable paper of Dr. Hall, clouded only by the fear, as he progressed, that he would leave practically nothing to dis-

cuss. However, I think that a few of the rarer forms of pneumonia, for some unknown reason, have escaped his sweeping onslaught. I shall therefore confine myself, in the few moments I have, to considering these less common forms of pneumonia.

As to the existence of an acute syphilitic lobar pneumonia, which the French physicians have championed with so much eagerness, there seems to be on this side of the water absolute skepticism, although I notice in the last classification of Delafield and Prudden that it has been entered. As to chronic syphilitic forms, there seems to be no question.

There are two forms of pneumonia of a rarer type, which, it seems to me, ought to be of more than passing interest to those of us who practice in Colorado where tuberculosis is so much in evidence. The first is the acute tuberculous pneumonia, a type which, in its sudden onset and rapid lobar consolidation, in its clinical features and physical signs, in every way simulates the ordinary croupous pneumonia, and which can only be differentiated by a careful microscopical examination of the sputum. Of this type we have a very beautiful example, with which you are all familiar, given in the classical work of Osler.

The second rarer form of pneumonia, for which we ought to be on the alert, is the actinomycotic form. Through the monographs of Hodenpyl, of Cruikshank and Callieri, we have been made aware of the peculiarities of this form of pneumonia, and we have come to recognize likewise that it is much more frequent than has been heretofore supposed. In the literature up to this time there are some four cases in which the onset of infection from the ray fungus has been exceedingly acute, taking the type of an acute broncho-pneumonia and following it so very closely that in all respects the type of the latter has been maintained throughout. Other cases of this actinomycotic pneumonia are much more insidious in their onset and slower in their progress; but the very fact that the two forms of infection by the ray fungus (one simulating an acute broncho-pneumonia and the other a chronic tuberculosis of the lungs) do exist, ought to put us on our guard and cause us continually to look for the microscopic evidence of this disease, which often may be found either in the sputum or in the pus which accumulates in a tuberculous pleurisy frequently complicating the trouble.

The influenzal form has been mentioned, its fatality noted. I want to speak for a moment regarding this, so far as the masking of its physical signs is concerned. I recall a case occurring in my practice during the past winter in which I think the most markedly bloody and viscid sputum I have ever seen was present, and where we would naturally look for clear evidence of a lobar pneumonia. But notwithstanding death did not occur until the fifth day, no physical signs at all parallel to those we would expect could be found. In this case, I might remark, the diplococcus of Fraenkel was present in large numbers.

As to aspiration pneumonia, the doctor has mentioned one form. In addition to this there is the form which occasionally follows haemoptysis, from the aspiration of blood into the lungs, and which may be tuberculous or otherwise. Besides this, there is an aspiration pneumonia in new-born infants where the maternal fluids are drawn into the lung during the process of labor.

The traumatic and septic forms, I believe, have not been mentioned. These are of great interest, particularly the septic form, to the surgeon as well as to the physician.

I want to say, in closing, that the clinical classification which Dr. Hall has practically followed makes no claim at all to scientific accuracy; but it has this one very great merit, I think, that it throws upon the mental canvas of us all clearer bed-side pictures of the various forms of pneumonia which we meet than any other classification at our disposal.

MODIFICATIONS OF PNEUMONIA IN TUBERCULAR SUBJECTS.

BY S. E. SOLLY, M. D., COLORADO SPRINGS.

Lobar pneumonia in tubercular patients is stated by the authorities to be rare. The statistics of post mortems upon patients dying from pneumonia show about 20 per cent. as occurring in tubercular subjects. Osler states that lobar pneumonia is a not uncommon termination of the last stage of tuberculosis. My experience in Colorado has not shown pneumonia to be frequent, either as a termination of the last stage of tuberculosis or as an occurrence in its course. Lobar pneumonia antedating

tuberculosis has not been so infrequent, though my histories of such cases have generally failed to reveal a close connection between the attack of lobar pneumonia and the subsequent tuberculosis. I do not know many cases in which the lobar pneumonia had been followed very shortly by tuberculosis, and in those cases in which it had the subsequent history indicated that the supposed lobar pneumonia was really an acute caseous tuberculosis. This, as you know, is a common mistake. In patients coming to Colorado with tuberculosis who also had had croupous pneumonia, the latter disease had not apparently any marked effect in increasing the tuberculosis; whereas when bronchial pneumonia had been a complication it had almost invariably aggravated the tuberculosis.

It would appear as if there was some antagonism between croupous pneumonia and tuberculosis, as if the individual who was susceptible to an acute sthenic inflammation of the lung was not susceptible to chronic tuberculosis. We are at the present time thinking so much of the microbes which give the character to each disease, and undoubtedly are an essential feature, that we do not sufficiently take into consideration the antecedent conditions which lead up to the development of the malady. I believe that when we study individuals more carefully, especially along the lines of temperament and idiosyncrasy, we will then be better able to explain why the patients who are the subjects of lobar pneumonia are infrequently the victims of tuberculosis. Perhaps it is because the lobar pneumonia is usually attended with high fever and violent irritation of the vascular and nervous system, which apparently show that there is a strong reaction against the disease; on the other hand, tuberculous patients rarely exhibit such phenomena, and it is their defective reaction which apparently leads to the spread of the disease and to death as a consequence of their deficiency of resistance. This is possibly the reason why lobar pneumonia is infrequent in tuberculous patients.

I have, however, occasionally seen cases of lobar pneumonia in the tuberculous. I remember one very interesting case of a man about the age of 35, of exceptionally strong physique, who had been the subject of chronic phthisis for seven or eight years. He had a very large cavity in the left lung and evidently no ser-

viceable lung tissue remaining upon that side. He emptied this cavity every night and morning by lying down and leaning over the bed towards that side, with his head down, when the contents of the cavity would come up very easily with comparatively little coughing. It was like the out-pouring from a bottle. His general condition was better after he came to Colorado than it had been for the preceding years of his illness, and he was able to enjoy life fairly well. The condition of the left lung remained substantially the same, while the capacity of the right lung increased so that it was unusually developed, and healthy except for a small amount of fibrosis at the extreme apex. His heart was strong, but its action was disturbed on sudden exertion, apparently by adhesions and displacement. I was absent for several months, and on my return I found him with an acute lobar pneumonia at the base of the right lung. He had been doing too much and had over-tired himself in exercising and then he had driven in a cold wind when he was heated.

The history of the attack and the rusty sputum, which contained pneumococci, showed clearly the nature of the disease. The interesting thing was that when he lay over on his left side he would bring up the pus from the cavity and the sputum then contained numerous bacilli as it always had done, but when he coughed without raising from the cavity (and he very seldom raised from the cavity except he was in that position) it was pneumonic in character. It was a very clear case of the two diseases existing in the same man. The pneumonia caused his death from the deficiency of breathing space.

The diagnosis of croupous pneumonia in tubercular subjects is much assisted by a study of the temperature curve. The temperature in chronic phthisis is intermittent—subnormal in the morning, moderately high in the afternoon, and declining slightly towards the evening. In acute caseous tuberculosis the temperature is of a remittent type, following a similar curve, but somewhat higher and above normal throughout the twenty-four hours. In croupous pneumonia the temperature is remittent, but higher and the remissions are lower.

The distinguishing character and amount of the sputum in these three diseases is of equal importance in making the diagnosis, but time does not permit of its discussion.

PNEUMONIA AS A COMPLICATION OF ACUTE DISEASES.

BY H. B. WHITNEY, M. D., DENVER.

Croupous pneumonia is a very rare complication of erysipelas, malaria, meningitis, and the acute exanthemata, especially scarlet fever. Its occurrence in these affections is of comparatively little interest, not only because of its great rarity, but because it presents no very marked deviations from its usual course. It is solely to pneumonia in a complication of influenza and of typhoid fever that I shall devote the few minutes allotted to my subject.

Of Influenza—From earliest times the intimate relation of pneumonia to influenza has been emphasized by all observers. Much confusion, however, has always existed as to the type of pneumonia thus encountered, and it is only of late, since the last great epidemic of 1889-'90 that clearer conceptions have arisen. Even now it must be admitted that opinions differ greatly as to the relative frequency of catarrhal and croupous pneumonia in grippe. This is not surprising considering the great difficulty of clinical diagnosis, to which I shall presently refer, and even of anatomical diagnosis, since in some cases it appears that granulated areas alternate with those which are smooth and distinctly catarrhal. Finkler, in forty-five cases of grippal pneumonia, found only two which appeared clinically to be croupous; and in his opinion that most cases are lobular he is sustained by Netter, Stintzing and P. Guttman. On the other hand Hertz, Weichselbaum, Leichstentern and Immerman held that the majority were croupous, while Biermer and Leyden claim that the two forms are about equally divided. Probably we shall not be far from the truth if we conclude that an average of various epidemics would include about an equal number of both the lobular and lobar forms. As to the frequency of pneumonia in grippe statistics again vary greatly, from less than 1 up to 20 per cent. Here there are undoubtedly enormous variations in different localities and epidemics.

These differences in the anatomical forms of grippal pneumonia correspond to differences in etiology. Bacteriological studies of the last ten years, and especially the discovery by Pfeiffer in 1892 of the specific bacillus of influenza, have done much to clear up existing confusion. As regards croupous pneumonia, in grippe as elsewhere, Netter affirms, and no proof to the contrary has hitherto been brought, that the genuine anatomical croupous pneumonia is always produced by the pneumococcus of Fraenkel. This seems to have been demonstrated in that form complicating influenza as well as in others. An equally well established fact seems to be that Pfeiffer's bacillus is not only capable of producing a genuine catarrhal pneumonia, but that it is responsible for the large majority of such pneumonias which occur in connection with grippe. This bacillus has been found by Pfeiffer himself, also by Beck and numerous other observers, in almost pure culture, both in the sputum and in the broncho-pneumonic foci. Without going further into the etiology of grippal broncho-pneumonia, it may here be simply stated that a rarer form of this affection seems attributable to pure streptococcal infection, and that mixed forms also not infrequently occur in which any two of these three germs—the pneumococcus, streptococcus, and influenza bacillus—may be concerned.

The symptoms of croupous pneumonia are, as a rule, greatly modified by the grippal infection. This is true whether the pneumonia is the primary and apparently sole manifestation of influenza, or whether it developes subsequently in its course. In general, its symptom-complex may be said to approach very closely to that of broncho-pneumonia. The initial rigor is usually absent, and often replaced by recurring chilly sensations. The pain in the side is often slight or altogether lacking. A rusty sputum is the exception, or its character is greatly modified by the associated grippal bronchitis with its abundant purulent expectoration. The course of the affection is more indefinite and often prolonged; the fever curve is extremely irregular, and rarely sustained for a definite period as in the typical form. Termination by lysis is very common, if not the rule. Dyspnoea alone may be looked for as quite constant. Finally, there is almost invariably a marked tendency to adynamia:—the face is pale, often cyanotic,

the body is constantly covered with cold perspiration, and the pulse is apt to be extraordinarily rapid and weak from the first. There is, in short, a marked tendency to rapid and fatal collapse.

The physical signs are exceptionally those of a regular lobar consolidation; but even here their development is usually delayed owing to the long duration of the congestive stage. More often, however, the local signs are atypical from the start. Dullness may be comparatively slight, with but imperfect bronchial respiration and bronchophony. Areas of bronchial breathing may alternate with those of vesicular; or they may be scattered through both lower lobes; or, owing to the frequent choking of the bronchi with purulent secretion, respiration may be much diminished or absent from the affected portions. The keynote to these variations is the tendency to focal consolidations and the accompanying purulent bronchitis.

The similarity of these signs, both rational and physical, to those of broncho-pneumonia makes it no longer surprising that so much difference of opinion should exist as to the relative frequency of these two forms in influenza. The clinical diagnosis would appear to be well nigh impossible in many cases. One can only presume the presence of croupous pneumonia in those instances where the clinical course approaches more closely to the typical, and particularly where there is the pathognomonic rusty sputum.

The mortality of all forms of grippal pneumonia is very high. The writer will never forget the apalling death rate at the county hospital in the epidemic of 1890. For a week, during the height of the epidemic, not a day passed without a death from pneumonia.

Of Typhoid Fever—Although the coincidence of pneumonia and typhoid fever is on the whole uncommon, there are many reasons why the etiological and clinical relation between these two affections is a matter of great interest. One of these is the still common use of the term typhoid-pneumonia. A recent paper by A. Fraenkel (Deutsche Med. Woch., 1899, No. 15) is an exceedingly valuable resumé of our present knowledge of this subject, from which I have abstracted many of the following data.

According to Fraenkel the expression typho-pneumonia, or, as the Germans say, "pneumo-typhoid," involves a consideration of the following three conditions:

1. Pneumonia with a typhoidal course. We are all acquainted in a measure with this form. A pneumonia from the start presents marked adynamic symptoms — weak and rapid pulse, great debility, frequent sweats, and pallor; to which may be added, in some cases, the more distinctly typhoidal phenomena of brown tongue, sordes, low delirium, and even, in rare cases, rose spots, diarrhœa, and enlarged spleen. If, as is often the case, such a pneumonia presents but slight or atypical physical signs, the diagnosis may become exceedingly difficult, though, of course, much aided of late by the Widal test. It is evident that such adynamic forms of pneumonia have nothing to do with typhoid fever.

2. Typhoid, complicated by pneumococcus infection of the lungs. This, as stated, is very uncommon. Fraenkel encountered it but six times in five hundred cases of typhoid.

Such a genuine croupous pneumonia may occur at any time during the course of typhoid fever, though oftenest, perhaps, at the acme or toward the end, and even in convalescence. The pneumonic symptoms are rarely typical, unless developing in convalescence. If the onset is in the midst of typhoid there will be no chill, very likely no pain, and as a rule no change whatever in the temperature. Of sputum there is little or none, although in a few instances it has been markedly hemorrhagic in character. This entire absence of rational symptoms makes diagnosis possible only by the discovery of consolidation with its accompanying auscultatory signs. And even the presence of such local evidence is not proof that we are dealing with a croupous pneumonia. Any attempt to differentiate between this condition and a lobular pneumonia, or even a simple hypostatic congestion, must often prove illusory. Here again we can only depend for a presumptive diagnosis upon the accidental presence of rusty sputum, or a very clearly defined lobar consolidation.

3. Can a pneumonia be produced by the Eberth bacillus of typhoid; and if so, may such a pneumonia be at times the primary and sole manifestation of the disease? If this be the

case, the old term typhoid-pneumonia may be properly retained. Fraenkel affirms that such a possibility is not yet demonstrated, though not to be unqualifiedly denied. It is true that Foa and Bordoni-Uffreduzzi, Karlinsky, and Chantemesse and Widal have all encountered instances of pneumonia where only the Eberth bacilli were found in the lung. These reports were inaccessible to me, but Fraenkel considers them all open to much doubt. He considers that some of them may have been lobular pneumonias or hypostatic congestions, into which the typhoid bacilli had afterward wandered from the blood, and possibly thus aided in the extension of the inflammatory process. Again, he refers to a case of his own where, in a pneumonia occurring in the course of typhoid, the Eberth bacilli were found in the scrapings, but in the alveoli only the pneumococcus in pure culture. He is therefore inclined to ascribe only a secondary significance to the presence of these bacilli in the lung as hitherto found.

We may, then, resume the present status of the relation of typhoid fever and pneumonia as follows:

A genuine pneumococcal pneumonia does rarely complicate typhoid fever; its rational signs are slight, and its physical manifestations are often difficult to distinguish from those of the lobular form and of hypostatic congestion.

Any other form of typhoidal croupous pneumonia is yet to be proved.

Pneumonia with typhoidal course has no relation etiologically to typhoid fever.

CHRONIC PNEUMONIA.

BY E. R. AXTELL, M. D., DENVER.

Much confusion exists in the use of the term chronic pneumonia. One authority says it means a stage of other pulmonary disorders; another, that it means a tubercular fibroid change; another, that it is a result of an extension of a similar process from the pleura; another, that it is essentially a dust disease.

By chronic pneumonia I mean "interstitial pneumonia," from whatever cause.

It is never a primary affair, but always secondary to croupous or catarrhal pneumonia, from failure of resolution.

It also results from hemorrhagic infarctions, from abscess of the lung, tumors, follows pleurisy and pleuritic effusion, tubercular deposits, or anything irritating to the lung tissue.

Chronic bronchitis may be the cause of the disorder, especially that form which is contracted by coal miners and workers in various metals which give rise to irritating dust and powders.

I do not take it that chronic pneumonia necessarily means pneumonokoniosis—the deposit of new formed fibrous tissue distributed in greater or less abundance along the bronchi in the chronic bronchitis resulting from the continuous inhalation of irritating particles of dust in certain trades. We know to-day that this disease is essentially a severe chronic bronchitis, due to a particular cause, and ending in bronchiectasis, emphysema, and fibrous or chronic pneumonia.

The morbid process in chronic pneumonia consists essentially in a gradual substitution, to a greater or less extent, of connective tissue for the normal lung. It is a fibroid process. This may have its starting point in the tissue about the bronchi, the blood vessels, the interlobular septa, the alveolar walls, or in the pleura.

It may be either local or diffuse.

Local fibroid changes are common. Hardly a post mortem occurs without local areas being found. It is a constant accompaniment of tubercle, tumors, hydatids, abscess, emphysema, and gumma.

Diffuse fibroid change in a lung or in both lungs may involve a whole lobe, or a whole lung, or a lobe in each lung, although the usual plan is for the process to be confined to one lung. If it follows as a sequence of acute fibrinous pneumonia—which is rare—a gradual process of organization goes on in the fibrinous plugs within the air cells. The alveolar walls become thickened and the newly formed connective tissue in the alveoli extends to meet it. But few cases have been carefully studied.

Broncho pneumonia, acute or subacute, is a big factor in the production of chronic pneumonia. The fibrosis usually starts in and about the bronchi. The alveolar walls become thickened,

and in the catarrhal plugs in the air vesicles there is a production of fibrous tissue. An entire lobe or a whole lung may be involved, and the normal lung substituted by connective tissue.

Interstitial pneumonia from invasion from the pleura occurs occasionally. We find in such cases a greatly thickened pleura and dense strands of fibrous tissue passing from it into the lung substance.

Chronic interstitial pneumonia due to inhalation of dust I have already referred to.

Chronic pneumonia is of necessity a chronic disease; it may last for years, and the patient may not be very ill. The patient first presents the symptoms of the original causative factor. At and from the time that we ought to expect a broncho-pneumonia to terminate in resolution, a chronic cough remains and a little shortness of breath persists. The cough is paroxysmal, and the expectoration copious and of muco-purulent or sero-purulent character. Cough and expectoration vary, and the latter is sometimes fetid. The dyspmoea persists. The patient has the appearance of delicate health and has fever. Hemorrhage is by no means infrequent—due to a dilated blood vessel.

The physical signs show the affected side immobile, retracted and shrunken. The contrast with the sound side is marked. When the left lung is the seat of trouble, the heart's impulse is often in the second, third and fourth interspaces. The percussion note may be absolutely flat, yet changes in the bronchi may produce other conditions, such as high pitched tympany, or even amphoric resonance. On auscultation the breathing sounds may be feeble, and range from that to broncho-vesicular or bronchial, or even amphoric respiration. There is often sharp accentuation of the second pulmonic sound, due to forcible effort of the right heart to push blood through the contracted lung.

Diagnosis: Given a case with a history of pleurisy or catarrhal pneumonia, followed by a chronic cough and expectoration, with temperature, but no bacilli of tubercle in the sputum, and the diagnosis is easily made.

With almost no exception the authorities class the fibroid pneumonia of tubercular disease under the head of fibroid phthisis. The only feature of difference, either clinically or physically in some cases, is the presence of the bacillus of tubercle

and the history. I have seen a great number of cases where every indication pointed to a healed tuberculosis by a fibroid deposit at the seat of the old trouble, yet in all of these the bacilli persisted in the sputum.

A fibroid pneumonia will not get well. We can do nothing for the condition itself, unless we find in some drug, like thiosiamine, a remover of old inflammatory cell products. The patient usually seeks relief from some intercurrent affection or for excessive cough.

Change of climate to Colorado is beneficial. Our climate dries out the excessive bronchial secretion, lessens the liability to decomposition of bronchial cavities, prevents liability of tubercular infection, and is of value until the right ventricle begins to yield as shown by increasing dyspnoea and a cardiac murmur at the tricuspid valve. Then these patients must be sent to a lower altitude where the climate is warm and dry, such as southern California or northern Florida. A rich, nutritious food and favorable hygienic conditions are necessary. Such patients should be kept away from tubercular cases. For fetid expectorations, inhalations or nebulized sprays of oil of eucalyptus, bichloride of mercury or carbolic acid are beneficial. Old authorities gave arsenic in small doses long continued.

DISCUSSION.

Dr. Wm. J. Rothwell—So much has already been said on the subject of pneumonia that I fear you are not prepared to hear anything further upon it. There is a great difference among writers, as the doctor says, as to what they mean by chronic pneumonia.

It has been properly defined by the doctor as a fibroid process, a simple increase of the connective tissue in the lung. This increase of tissue gradually destroys the air cells, interferes with the circulation through the arterioles, causes contraction of the small bronchi and dilatation of some of the larger ones. Fibroid phthisis is one of the synonyms for chronic pneumonia. If we give to the word phthisis its original meaning, a wasting away, in this case a wasting away or destruction of the air cells from excessive growth of the connective tissue, the term is cor-

rect. But it must be distinctly understood that this form of phthisis has no connection whatever with pulmonary tuberculosis. Chronic pneumonia has a varied etiology. The essential etiological factor is a prolonged irritation of the lung tissue. It follows acute lobar pneumonia in which resolution is incomplete; the disease is then unilateral in its distribution. It follows acute lobular pneumonia, its distribution being in these cases bilateral. When it is a sequel to pleurisy, one lung only is involved. The inhalation of irritating substances is a not infrequent cause. The first stage is inflammation of the bronchial mucosa, but if the exposure to irritation be continued long enough, pulmonary fibrosis invariably results. This is the origin of the various dust-diseases included under the head of pneumonoconiosis, as miller's phthisis, grinder's phthisis, miner's phthisis, etc. Chronic pneumonia may pursue a benign course to the end, or at any stage in its course the lung may become infected by the bacillus tuberculosis and become from that time a case of pulmonary tuberculosis. Even when it pursues a benign course to the end, its resemblance to the latter disease is very striking. There are hemoptysis, contraction of the chest wall, consolidation of the lung tissue, bronchial cavities resembling the ordinary cavities of consumption, fever, impaired nutrition—all symptoms closely resembling those found in an ordinary case of pulmonary tuberculosis, and yet there is no tuberculosis about it, unless secondary infection takes place. (Time called.)

Dr. S. E. Solly—Concerning the treatment of pneumonia—I formerly used digitalis much more frequently than I do now. I certainly would not use it as a routine practice. Strychnia is undoubtedly the most valuable of all the drugs, but many cases do well without it and almost always better with its omission in the early stages, when the conditions are very different to what they are later in the progress of the disease. As to the use of cold applications, Dr. Axtell, in speaking of them, does not mention what is the most immediate and important effect of the application of the cold bath, that is, its influence upon the nervous system. The refrigeration of the surface through the healthy resistance of the body stimulates the nervous system, and this is of more value than the reduction of temperature.

Secondarily this nervous stimulation increases elimination. The great trouble with the cold bath has been the exhaustion and discomfort to the patient from moving him to the bath and back again, but now we can give a patient a bath without moving his body by means of a rubber sheet slid under him and then tied up to the footboard and the headboard. I therefore regard cold bathing as a very valuable remedy, particularly if it is applied to the whole body. I do not think the wet compress applied to the chest alone of value. The ice bag over the heart gives relief. It steadies and braces that organ and has a good refrigerating effect, but must not be kept on very long at a time.

There is one remedy that has not been referred to because probably few of you have had any experience with it, and I only a little while a student at the hospital. That is blood-letting. There is no doubt the abuse of blood-letting has led us to give up a remedy which was of great value in certain cases, and it is much to be regretted that we do not now occasionally resort to it. The reasons for its beneficial effects are probably the immediate lowering of the blood pressure, relieving the embarrassed heart, and secondarily the rapid blood regeneration that follows, fortifying the blood's resistance to the toxines generated by the pneumonia. We must remember that in the later stages the danger is due to this blood-poisoning much more than to the mechanical effects of the pneumonia, and therefore to assist the elimination is of prime importance.

THE SURGICAL COMPLICATIONS OF PNEUMONIA.

BY LEONARD FREEMAN, M. D., DENVER.

The principal surgical complications of pneumonia are abscess and gangrene of the lung, empyema of pleura and of pericardium, suppurative arthritis and peritonitis, abscesses in various situations, and general septicaemia. None of these affections is common, and some of them are extremely rare. They may occur from the presence of the pneumococcus without pneumonia.

Pneumococcus arthritis has been observed a few times in connection with various joints, among which are the shoulder, hip and knee. Vogelius has collected eleven cases. Pus from the inflamed joint usually contains a pure culture of Fraenkel's bacillus. The bones and cartilages are not involved, and usually but one joint is invaded. The affection may develop during an attack of pneumonia, or subsequent to it. The treatment is that which applies to any suppurating joint—arthrotomy, irrigation, drainage, etc. The prognosis is favorable.

Abscesses are occasionally encountered. For instance, Schnitzler (Centralbl, f. Chir., No. 12, 1894) reports one situated in the upper arm of a child. The pneumococci were of full virulence, which is a point of some interest, owing to the frequent assertion that suppuration occurs in the presence of weakened cultures only.

Peritonitis and general septicaemia are very rarely due to the capsular coccus. Bacciocchi has reported a case of septicaemia. (Sperimentale, No. 16, 1893).

Empyema of the pleura and of the pericardium is not extremely uncommon. When due to the pneumococcus the prognosis is better than when caused by other micro-organisms. It is even claimed that at times, especially in children, one or more aspirations will be sufficient to effect a cure. This, however, can not be depended upon, and almost always the same treatment must be employed in a pneumococcus empyema as is indicated in other forms of the disease. This consists briefly in early incision, preferably with resection of a rib, and free and prolonged drainage. Irrigations are no longer used. In addition to prompt evacuation of pus, everything possible should be done to promote reëxpansion of the compressed lung. A heavy, snug absorptive dressing acts as a valve, producing a certain amount of negative pressure within the pleura, and is perhaps preferable to various complicated forms of apparatus designed for the same purpose. Increased intra-bronchial pressure may be obtained by certain respiratory exercises, or by the inhalation of compressed air.

The surgical complication of pneumonia which at present claims attention most prominently is *abscess of the lung, with or without gangrene.* It is only with the recent advances of pul-

monary surgery that we are beginning to learn how best to manage these perplexing cases. As in many other affections, early operation has come to be recognized as of the utmost importance. This, of course, presupposes accurate diagnosis, which may be very difficult.

A stumbling-block in the way of pneumotomy has always been the danger of collapse of the patient on opening the pleura, due to sudden pneumothorax with retraction of the lung. This does not invariably take place, although the fear of its occurrence is ever present. Fortunately, with the vast majority of abscesses, sufficiently extensive adhesions of the visceral to the parietal pleura are found, but it is very troublesome to determine their presence beforehand. Of course, if the outer layer of the pleura be found thick and opaque, adhesions in all likelihood exist. Quite recently Ssapeshko (Centralbl. f. Chir., No. 15, 1899) has suggested that the absence of adhesions over the site of an abscess can be easily demonstrated by inserting a blunt aspirating-needle, with a lateral opening, into the pleural cavity through an incision in the skin. The needle is connected with a V-shaped glass tube containing sterile salt solution. If there are no adhesions, the fluid will rise in the arm next the needle. In this case the operator should inject through the needle, first cocaine to control pain, and then a few drops of a 1 to 2 per cent. solution of formalin. Adhesions are said to form in from five to seven days. It is not certain, however, that this procedure is reliable.

It was long ago appreciated that in order to enable the surgeon to explore the lung and operate upon it with success and safety, means must be devised to prevent the occurrence of sudden pneumothorax. Accordingly many devices were suggested, among which may be mentioned:

First—The formation of adhesions, (a) by applying irritants to the chest wall, to the exposed parietal pleura, or to the intrapleural surfaces; (b) by acupuncture or ignipuncture, or by means of retained hooks or needles.

Second—Sewing together the surfaces of the pleura, either before or after incision.

Third—Opening the pleura, quickly seizing the retreating lung with appropriate forceps, dragging it as a plug into the incision, and fastening it there with sutures.

There are objections to all these procedures—irritants are not always effective, sutures easily tear out, and seizure of the lung is too uncertain.

Within a short time, through the investigations of Tuffier, Doyen, Qûenû and Longûet, it has been found that collapse of the lung can be prevented during thoracotomy by artificially increased intra-bronchial pressure. The apparatus originally designed for this purpose has been perfected by George E. Fell, of Buffalo, New York. It consists, essentially, of an intubation-tube attached to a pair of bellows. A pressure equivalent to about 6 mm. of mercury is required. The method seems safe and practicable, and bids fair to give great impetus to pulmonary surgery. With the lungs artificially distended, the surgeon may explore and operate without fear or hindrance.

When the pleura has been protected against the entrance of air and pus, abscesses may be opened with a knife, a blunt instrument, or with the thermocautery. Bleeding is generally readily controlled by packing. Irrigation should not be employed for fear of inundating the bronchi. If a number of small abscesses exist, as is sometimes the case, their dividing walls should be broken down.

A few statistics in relation to abscess of the lungs may be of interest:

Fabrikant (Centralbl. f. Chir., No. 49, 1895) has collected thirty-six pneumotomies with seven deaths (19.4%); Terrier forty-nine cases, of which 23.8% died; Reclus twenty-three cases, with twenty recoveries; Quincke fifty-four cases, of which 37% were cured, 20% improved, 6% unimproved, and 37%died.

When gangrene exists the mortality is greater—about 50%. The mortality of chronic abscesses is perhaps 40%, and, in addition, fistulae are apt to persist in the cases which survive, owing to rigidity of the abscess walls.

TREATMENT OF PNEUMONIA.

BY E. P. HERSHEY, M. D., DENVER.

In considering so important a subject as that of the treatment of pneumonia, it is of interest to know that it is to be done in a symposium where it can be thoroughly discussed, and, if necessary, rigorously criticised.

It is not the purpose of this paper to review the treatment suggested by the different authors, and thus occupy your time with many remedies that have history as their only value. A plain, simple treatment, based upon actual experience, is all that this paper promises.

Given a typical case of croupous pneumonia—a chill, followed by high fever, the flushed face so typical of this disease, rapid shallow respiration, pain over the region affected, all these associated with a dry coated tongue, there are three remedies, that, grouped together, are all that one can desire:—the infusion of digitalis, the sulphate of strychnia, and ice compresses. These three remedies have given results so highly satisfactory that any deviation from them would be associated with many misgivings as to the outcome of the attack.

Few cases of pneumonia are dynamic in character, and even these in a few hours become adynamic. In the former it would seem ill advised to administer large doses of digitalis; but when we consider that this drug is slow in its action, we can pretty nearly prophesy that the asthenic condition will supervene before the remedy has fairly taken hold, and we are thus ahead of the disease.

Digitalis as usually prescribed in this disease has little or no effect. The proper method of administration is in half-ounce doses of a freshly made infusion every half hour, every hour, or every two hours, as may be indicated by the severity of the attack. In the course of six to eight hours the pulse begins to lower in frequency, both the diuretic and diaphoretic action of the drug have become manifest, and with these the progress of the disease almost invariably ceases. The digitalis should be continued until the characteristic physiological symptoms have

been reached, i. e., the full, bounding, slow, irregular pulse. Should the disease progress after this, the pulse will be found to have lost its slow irregular beat and again become rapid. This is an indication for the further continuance of the drug. During this, strychnia should be used, either hypodermically or by the stomach. The dose should be the $^1/_{30}$ of a grain every two hours. Unlike digitalis, there are no contraindications to the use of strychnia. Digitalis should never be administered where there is any indication of atheroma, when an aneurism is present or where there is aortic stenosis.

It is becoming almost universally conceded that the ice compress leads in all topical applications. By its use the pain is greatly relieved, the patient feels soothed, the temperature is lowered, and the breathing becomes less difficult. At first a very formidable looking remedy and one to which much objection may be offered by the family, the patient, however, soon appreciates its soothing effects and desires its use.

In alcoholics, stimulants must be freely allowed from the start, but in other cases should be used only when indicated.

The diet should be as nutritious as possible. Beef juice, egg nogs, soft boiled eggs, milk preferably peptonized, and milk-toast should be administered every two or three hours, separately or any two of them combined.

At the first evidence of cyanosis, oxygen by inhalation should be administered, and continued at intervals of every two hours until dyspnoea and cyanosis have disappeared.

For the annoying gastro-enteritis so frequently associated with this disease, no remedy has given such good results as five-grain doses of eudoxine administered every four to six hours. This, associated with occasional broken doses of calomel, more particularly when the tongue is dry, controls this distressing symptom; but care should be taken under no consideration whatever to bring about any purgative action after the first twenty-four hours.

There is one important factor that should be considered in the treatment of pneumonia. It is the hygiene of the sick room. Open windows are the one great secret of success in the outcome of these cases. There is no danger of the patient taking cold, hence fresh air may be allowed to freely enter the room. Perfect

cleanliness about the person, by means of sponging followed by rubbing with alcohol, tends greatly to refresh the patient. The sheets and pillow-cases should be changed daily.

DISCUSSION.

Dr. W. T. Little—Mr. President and Members of the Society: I feel some trepidation in standing before you, being so much the junior of the majority, in both years and experience, and discussing the treatment of pneumonia.

I think it is generally recognized that pneumonia is a self-limited disease and that an expectant, symptomatic treatment is the best. We can not cut short the inflammatory process by any abortive treatment, and, consequently, our attitude is one of watchfulness rather than one of active interference. Take, for instance, croupous-pneumonia in a sthenic individual and I think we can very often get through the attack without administering a single dose of medicine. However, there are a great many complications often minor in their consequences but still requiring our attention, such as the pleurisy pains which are so distressing at the outset. These can usually be controlled by cold or heat. In a strong individual I think cold is better than heat. However, we will have a good many cases in which we must resort to morphine, although some authors believe that morphine is a dangerous drug to use in pneumonia. Yet I believe we may use it freely although cautiously at the very beginning, but later I think it is better withheld. If we adopt the cold pack or the cold bath treatment I believe it should be done early in the disease and not as a last resort. Unfortunately I have had but little experience with it, but I believe in the average case of lobar pneumonia, if begun immediately, it will meet our indications better than any other form of treatment. As Dr. Hershey has said, the objections of the family have nearly always to be overcome, and a great many of us hesitate before we try the use of so formidable a remedy.

Of drugs I think strychnine leads them all. Digitalis is of questioned benefit. A great many of our best authorities believe that digitalis is a splendid remedy, while others confess that

they get no decided benefit from it. But in strychnine we have not only our heart tonic, but our respiratory stimulant.

Dr. Hershey mentioned the use of the cold pack, the ice on the chest, but failed to mention the use of the cold bath. This is a treatment that I have never tried nor witnessed at the hands of others, and if there are any present who have tried the cold bath or immersion as we practice it in typhoid fever I should certainly be glad to hear their experience. I really do not see why it should not be an excellent method where we have an extremely high temperature. But this disease being a self-limited one, unless the temperature goes extremely high—above 104°—I doubt whether it is necessary for us to resort to any active antipyretic treatment. Graham in Hare's system of therapeutics advises strongly the cold plunge, and recommends it to be begun when the temperature reaches 103°.

THE HYDRIATIC TREATMENT OF PNEUMONIA.

BY R. K. MACALESTER, M. D., GLENWOOD SPRINGS.

In the limited time allotted to me for the discussion of hydrotherapy in pneumonia I shall endeavor to cover as much ground as possible by presenting in the form of a brief resumé the well established data of this rather extensive subject. Those wishing to familiarize themselves with details will find this branch of therapeutics elaborately treated in a recently published book by Dr. S. Baruch,* of New York, to whom, indeed, as to Winternitz in Europe, great credit is due for the development and propagation of hydrotherapeutics in this country. I was fortunate enough to have had instruction from both the aforenamed authorities, from which, as well as from their writings, I shall quote freely, without special reference, in the following.

Many observers of the widest experience in the treatment of pneumonia by various methods extol the virtues of hydro-

*S. Baruch: Hydrotherapy, N. Y., Wm. Wood & Co., 1898. See also: Hydrotherapy in the Pneumonia of Children, Med. News, Nov. 19, 1898; and Winternitz: Die. Hydrotherapie auf physiol. and klin. Grundlage, Vienna and Leipsig, 1890.

therapy, and comparative *statistics* demonstrate its therapeutic efficiency. Thus, for instance, Dr. Fenwick of the London Hospital in an analysis of 1,000 cases of pneumonia met with failure in but 10% of those treated by various cold applications, whereas the mortality was double as great when other methods were employed. In the J. Hood Wright Memorial Hospital of New York the total mortality from pneumonia has been reduced over one-half since hydriatic treatment has been adopted. Penzoldt, from the experience of an enormous material of 2,200 cases of pneumonia in children, concludes that preference should always be given to a cautious bath treatment.

By first considering some of the *physiological effects* of cold applications to the body surface, we can best judge as to their applicability and to what extent they meet the therapeutic indications in pneumonia. A moderately cold application to the skin causes a primary contraction of the cutaneous vessels which is followed by a tonic active dilatation, in contrast to the passive hyperaemia produced by warm procedures (as, for instance, poultices). These latter relax the vasoconstrictors, giving rise to a stasis, whereas cold stimulates the vasodilators, producing an active hyperaemia with maintenance of vascular tone and improved circulation. Mild cold procedures—such as usually employed in pneumonia—act reflectively through stimulation of the cutaneous nerves upon the centers in the central nervous system and thence upon the functional activity of various organs. The respiratory system is stimulated and inspiration deepened. The effect on the circulatory system is stimulation of the heart action (evinced by more forcible ventricular contractions), and neurovascular excitation, in consequence of which arterial tension is raised and the blood propelled with greater velocity and force. The general condition is invigorated and refreshed, and cerebral activity stimulated. The secretory organs evince greater activity, the amount of secreted urine, for instance, increasing considerably. Owing to the compensatory powers of our body, internal temperature is not materially influenced in health.

By applying the foregoing data we shall see that the therapeutic requirements in pneumonia are thereby well fulfilled and that hydriatic treatment is based on a sound *rationale*.

The *therapeutic indications* are: "(1) To stimulate and invigorate the nerve centers, with a view to enhancing the patient's vital powers; (2) to prevent and control heart failure; (3) to reduce temperature; (4) to eliminate toxins." (Baruch.)

ad 1. The stimulating action of cold applications upon the nerve centers is reflected to organs of vital importance, upon whose functions the patient's resisting powers to the toxic substances generated by the diplococcus pneumoniae of Fraenkel are dependent. Soon after applying cold the patient grows calmer, respiration deeper and more regular, dyspnoea is relieved, and expectoration facilitated. There is also improvement of appetite and sleep and of the functions of the skin and kidneys.

ad 2. Heart failure, the most dreaded complication in pneumonia, is better averted by hydriatic measures than any other available means. The heart action is aided and maintained in the following manner: The active hyperaemia of the skin, following the rapid primary contraction of the cutaneous vessels, relieves the heart at once by broadening the stream in the cutaneous capillaries. At the same time arterial tension is raised, as proved by the better filling of the radial arteries, and a freed, unembarrassed pulmonic and systemic circulation is established. When we consider the enormous vascular area of the skin, estimated as being capable of holding 30 to 50 per cent. of the entire blood of the body, we can readily realize that this is a mighty source of depletion.

ad 3. The fact that pneumonia patients are extremely susceptible, and that their temperature may be easily reduced by cold procedures, necessitates great care and precaution in the application of such measures. Although high temperature may be an important element in pneumonia and other infectious diseases by imposing more work upon the heart and adding greatly to the patient's discomfort, still it is by no means the chief danger. As I have often insisted in discussing the matter, fever is but a symptom of disease, indicating the reaction on the part of our organism in its struggle to overcome the infective process. If vitality sinks so low as to offer no resistance to the toxaemia, there is no fever, and the patient collapses at once—an occur-

rence which we have all had occasion to observe in lethal cases of pneumonia. Therefore the indiscriminate administration of antipyretics, with a view of reducing temperature and thereby meeting the principal therapeutic indication, is as fallacious as is the idea so deeply rooted in the professional mind that the main attribute of hydrotherapy in febrile diseases is reduction of temperature.

ad 4. The support that cold applications give to the nervous system, raising the patient's vitality and the functional activity of various organs, is conducive to the elimination of toxins.

The hydriatric methods in pneumonia. Owing to the susceptibility of pneumonia patients to cold, the milder hydriatric procedures, such as the cold chest compress or the wet pack, are indicated in general. Furthermore, these are more easily applied and controlled, and are attended by less agitation, disturbance and exertion on the patient's part. In others' as well as in my own experience the milder measures are indeed quite adequate to fulfill all the therapeutic requirements in both the croupous and catarrhal *pneumonias of adults.*

The cold chest compress is preferable to other procedures in pneumonia—a conclusion I had reached independently some time ago, and which I now find is in harmony with the opinions of some others. Its correct application, as all hydriatric procedures, requires some experience and care, therapeutic failures being usually due to faulty technique. The chest compress is composed of three folds of linen or old muslin, cut in a manner to fit the entire chest from above the clavicles down to the umbilicus, with slits in the axillary region to form flaps and cover the shoulders. It is then wrung out of water, so that it does not drip, at the temperature of 60° F., snugly applied around the thorax, covered with a piece of closely woven thin flannel of the same shape but at least an inch wider in all directions, and secured by safety pins. At first the application is changed every half hour, then every hour or two until the patient's temperature is below 100° when it may be discontinued. The compress should not be covered with oiled silk—a very popular proceeding on the part of attendants for the sake of convenience and protection of the patient's bed and clothing—as this would convert it into a

poultice and deprive it of its stimulating and gradually cooling action.

The wet pack, at the temperature of 60° to 70° F., being a somewhat more severe procedure than the chest compress, is indicated in the graver forms of pneumonia with high temperature. It is a very popular and efficacious method, has warm advocates, and deserves special mention.*

Other hydriatric methods in pneumonia, advocated by prominent observers, are: Cold full baths, temperature 60° to 70° F.; tepid baths, 90° to 92.5° F., both with or without friction and ablutions; ice-packs; the ice cradle; cold sponging, etc.

In the *pneumonia of children*, the same methods as enumerated in the foregoing for adults are employed in somewhat modified form. The child's sensitive nervous organization, with its greater susceptibility to cold and to the development of nervous symptoms and the minor resisting powers of the heart as compared with the adult's, render sound judgment in prescribing, and extreme care in the application of, hydriatic procedures imperative.

In my experience, based on the observation of a considerable material treated during my practice in New York, the cold chest compress alone proved a reliable and adequate remedy in the vast majority of cases. For children under three years of age Baruch favors tub baths of five to eight minutes' duration, with continuous friction at the temperature of 95° gradually reduced to 85° or 80° F. according to the body temperature, whereas in older ones preference is given the cold chest compress. He also recommends the copious administration of cold water at regular intervals in the pneumonia of both children and adults, and I need scarcely add that a hygienic regime should be strenuously adhered to.

Epicrisis. The virtues of hydrotherapeutics, being based on sound principles and scientific clinical evidence, entitle them as much to adoption by the profession at large as do the popular medicinal remedies in routine practice. I do not presume to say that drugs can be dispensed with; they have their place and field of usefulness; but their prolonged administration is often de-

*While I was attending Professor Winternitz's clinic in Vienna, this method was employed extensively in pneumonia with excellent results.

pressive to the one or other organ, is toxic or nauseating, etc., and they do not always fulfill the requirements of judicious treatment. In support of this view, and in connection with the pneumonia of children, allow me to detail an illustrative case from my past experience:

H. R., a well developed girl, 3½ years old, was taken ill after measles with pneumonia five days previous to my first visit. I saw at a glance that her condition was very serious, and on examination found the entire lower and middle lobe of the right lung consolidated. The temperature was 103.2°, the pulse scarcely appreciable, approximately 160, the breathing rapid, superficial and obstructed; the lips and extremities were markedly blue from cyanosis, and the child lay there failing fast, somnolent, and at times agitated. On enquiry I ascertained that she had been given various kinds of medicines, all of which were inefficacious and promptly ejected, during the last two days, and it was with difficulty that any nourishment could be retained. I demonstrated to the parents how to use the cold chest compress by applying the first one myself, prescribed a simple expectorant, and waited to observe the result. In about an hour improvement began. The cyanosis disappeared, the pulse became stronger and slower, the respiration deepened, cough and expectoration set in, consciousness returned, and, in short, the child was actually resuscitated. Shortly afterward she fell into a peaceful sleep. From then on she progressed uninterruptedly and was convalescent two days later.

In conclusion, I venture to state that anybody who has witnessed a few such transformation scenes as the one just described, resulting from the correct application of water after medicinal agents have proved futile, will become a convert to hydrotherapy.

DISCUSSION OF SYMPOSIUM ON PNEUMONIA.

Dr. C. Denison—Dr. Solly gave the reason why croupous pneumonia is less frequently seen in the tubercular subjects. I am inclined to agree with him as to this infrequency. When we consider the prevalence of pneumonia among tubercular subjects it seems to me that there is reason for expecting the other forms

of pneumonia, i. e., catarrhal pneumonia, bronchial pneumonia, pleural pneumonia and fibrous pneumonia, to occur in those subjects instead of the croupous variety, because those other forms are accompaniments of the tuberculous infection.

I would give another reason, which I might say is climatic; that is, in Colorado, the croupous pneumonia, if it is an infective or a zymotic disease, would, it seems to me, be favored by those conditions which have to do with the air in malarial districts particularly and which conditions are not found here. This is a fact, as proven by the mortality reports of the United States census for the decade ending 1880. These reports by states give the percentages of deaths from pneumonia—and bear in mind that catarrhal pneumonia, bronchial pneumonia, chronic pneumonia and the croupous pneumonia are all included; therefore, it is evident that the malarial or zymotic element is what governs the great prevalence of pneumonia in malarial states, and quite probable that other forms than croupous make up the small percentages in high lying districts where consumptives resort for health purposes. In proof of this I averaged those states which gave the highest percentages of pneumonia and found that the twelve states included in this group gave an average of 12½ per cent. of deaths from pneumonia, and these states included Arkansas with a ratio of 19 per cent., Texas 15 per cent., and the other states in the Mississippi valley in lesser proportion, even including some like Tennessee, which are partly mountainous; while the twelve states of the Union, including the territories, which gave the least average percentage of deaths, averaged 4½ per cent., and included New Mexico, 2½ per cent., and Colorado, Idaho and other high-lying states, and of necessity included a great many imported cases of tuberculosis and weak lungs. This small per cent. I believe almost wholly made up of the other forms, especially bronchial pneumonia in children, and to the comparative exclusion of croupous pneumonia.

So far as my own personal experience is concerned, looking back through a short practice in Hartford, Conn., in my earlier professional life, I know that I used to meet with croupous pneumonia much oftener than in Colorado. It would be interesting to learn what the experience of others is on this point. But I think

this a fair explanation of why we find the other forms of pneumonia especially prevalent in those whose constitutions are pulled down by tubercular infection and who have come to Colorado to reside.

Another question is very important. We do not know the ratio of people who have some tubercular infection in a community like ours. The impression is growing upon my mind that there is a larger proportion of people who have some degree of tubercular infection, and who have not thus far got the credit for it, than we know. We know nothing about the percentage of cases (if we could speak of tubercular infection by percentages) who have, say, from 1 to 5 per cent. of infection; i. e., if we consider that from 20 to 50 per cent. of infection might be required in order to have indisputable evidence that they were tubercular. To my mind, it would take a very large dose of tuberculin to prove that a person was tubercular if he had less than 5 to 10 per cent. of infection; I mean, if we could speak of this latent infection in this percentage way. This idea was suggested to me by a report seen of Dr. N. S. Davis's statement, as I understand at Columbus, that he considered that all people had some degree of infection of tuberculosis. Infection with tuberculosis is *relative*, and the related amount of infection, together with the amount or *degree of resistence* in each individual case, is that which we as physicians ought to try to find out. A very small amount of infection may be still more prevalent than we have yet been led to believe.

I was very much interested in Dr. Freeman's excellent paper, but as I shall have something to say with reference to the dangers of operating upon the lung in my paper on Wednesday afternoon, I will defer my opinion until that time.

I was surprised that Dr. Hershey in his paper did not mention one of the important facts to be kept in mind in the treatment of pneumonia—the necessity, especially here in Colorado, of controlling the chest movements as a factor in treatment. This seems to me very important. We have to breathe at this altitude, one mile above the sea, one-fifth more air than we do at sea level to get the same amount of oxygen. The action of the lungs in all these acute pneumonic diseases is a disturbing ele-

ment, and it seems to me that the best method of controlling the straining of the lungs is by a well-fitting cotton jacket drawn as tightly as the patient can bear and breathe with comfort. In the broncho-pneumonias of children especially I have found the association of this cotton jacket with the antiphlogistine poultice to be wonderfully helpful in controlling restlessness, pain and fever.

Dr. E. Stuver—There is quite a wide divergence of opinion as to the utility of digitalis in the treatment of pneumonia, some eminent authorities regarding it as almost a specific and the best remedy to be used in this disease. Others do not attach much importance to the remedy, which, I believe, is to a certain extent due to the preparation of digitalis used. Dr. Hershey in his paper spoke of the use of the infusion of digitalis in large doses. The objection to be urged against the use of the infusion is the fact that the toxic or heart depressant principle of digitalis is freely soluble in an aqueous solution; that is, water dissolves the toxine freely, whereas the alcoholic tincture contains a very small amount of this toxic principle; and I believe this will account for the slow, irregular pulse to which he has referred. The toxic or depressant principle contained in the aqueous solution produces this irregularity in the heart's action which does not follow the use of the alcoholic solution. I have obtained much better results from the use of the tincture or normal alcoholic solution of digitalis than I formerly obtained by the infusion in large doses.

With regard to the hydriatric treatment, I wish to allude to the case of a child that I treated many years ago by warm baths. The infant of about 20 months of age had a temperature of 106⅘°. I used the ordinary antipyretics, but got no reduction of temperature whatever until I put the child in warm baths. when the temperature rapidly went down to a safe limit and did not again return to such a high point.

Dr. E. R. Axtell—I think we are all deeply interested in the treatment of pneumonia, and I feel sure that some of us would differ from Dr. Hershey in his treatment as he has outlined it. The application of cold to the chest, or the putting of a patient having pneumonia into a cold bath, has for its object certain definite results. If we analyze what they expect to obtain by

this treatment, we will find they expect to get an increased leucocytosis, an antiphlogistic local action, a diminished temperature, an increased blood pressure, an increased oxidation and an elimination of the various toxines by means of the kidneys and the intestines. It seems to me that we can get the same identical results with less radical procedure than the full bath. I may be mistaken in this, but certainly in people who have pneumonia we can increase the blood pressure by means of strychnia, and by applying heat to the chest we certainly get an antiphlogistic action; then if we increase the leucocytosis and the various alimentary processes by a medicine like nuclein, which is well known to promote leucocytosis in the body, and by reducing temperature by cold sponging and by the use of oxygen to increase oxidation, it does seem to me that in a much simpler way we can get exactly what they get by the cold bath or the cold pack. Certainly a hot poultice to a case of pneumonia will quiet the patient as effectually as a cold pack. I have used the cold pack in two cases. One of the patients died, and the other patient did no better on that treatment than other patients of mine on the old poultice. I am certain I can get the same action by means of drugs and simple procedures that is expected by the elaborate process of the cold bath.

Dr. J. T. Melvin—There are 353 members of this society, and I presume if we had a canvass we would find there were 353 methods of treating pneumonia, to each one of which could be ascribed success, as this is a self limited disease. Certain it is that the individual experiences of the members differ very much, differ radically in different locations, as to the efficiency of different therapeutic agents. There are those who maintain that the regular administration of aconite upon the principle which Prof. Ringer lays down, i. e., to give one drop or more of aconite every half hour until the pulse is reduced to 90 or below, produces the best results in all forms of lobar pneumonia; others are enthusiastic advocates of veratrum viride, digitalis, or strychnia. But instead of going over the full list of remedies which have been used, I desire to call attention to the fact mentioned in Dr. Hall's paper, which I think is thoroughly established, that the causes of pneumonia—that is, the germs—may be of a number of varieties. Not all pneumonia is produced by the pneu-

mococcus alone, but there are different forms which are produced by mixed infections, and while the general process goes on under the term of pneumonia, still I think we may have different etiological diseases on account of previous or coincident infection by other bacterial forms, and I think the different results which the different members of the profession arrive at may be due to the different classes of the disease with which they come in contact. In connection with this and what has been said in regard to the digitalis treatment, I would refer to the work which has come from our experimental laboratories, showing that amorphous digitalin (Mercks) acts in culture tests as a *specific* against the pneumococcus of Fraenkel. Now, if that is supported and proves to be a fact, if those experiments can be corroborated clinically, we would then have an explanation why, in certain cases with certain practitioners, the use of digitalis has been followed by such remarkable success, and an unanswerable indication for rational treatment. In the application of cold we have the same disagreement of opinion, because, I think, we are not discussing the same identical case. There are occasional cases which I have seen in my own practice in the country where the cold pack and cold baths seemed to produce immediate and lasting effect upon the disease and were most potent agents for good. Such cases are few. Of the cases we meet with in the country the majority are very much more benefited by the hot pack.

Dr. H. B. Whitney—It seems to me that we would make a mistake if we accepted the suggestion that Dr. Melvin has just made, that croupous pneumonia is commonly induced by many different germs. I do not believe that is the teaching of the present day. I believe that we are most of us treating the same disease when we treat croupous pneumonia, and that the great majority of the cases which we meet are the result of infection by the pneumococcus of Fraenkel. It is right, therefore, on this theory, that we should look for a specific. As far as my recollection goes there are but two remedies which can make any claim to be specific in the treatment of pneumonia. One is the old one, digitalis, which has been used as a specific in very large doses, and which I do not think has the sanction of most prac-

titioners to-day. The other one, which is of more recent origin. and which I think perhaps is not known to most of you, is the salicylate of soda. I want to say just a word about this drug, which I have had little opportunity to use, but which has given me so great success in these few cases that I think it ought to be tried by others. Briefly, I will only say, without going into detail, that some three years ago a prominent German clinician directed attention to the use of salicylate of soda in large doses in croupous pneumonia. He had employed it in some sixty or seventy cases (I have mentioned this before in the County Society and it is old to some of you, but you will pardon me for repeating it), and in these sixty or seventy cases the results obtained were truly remarkable. Then about a year ago a physician in New York state seems to have stumbled onto the same remedy by mistake in diagnosis. He thought that a case which he had was rheumatism, and gave large doses of salicylate. It proved to be a case of croupous pneumonia and ran a remarkably mild course. Encouraged by that result, he used the salicylate in something like sixty or seventy cases also. His results also, if we can believe his report, have been remarkably good. He regards it as a genuine specific. In many cases the disease is said to have been aborted upon the third or fourth day. Personally, as stated, I have had an opportunity to use this remedy early in the disease in but a very few cases. Of course in the hospital we get our cases on the second or third day, and I have not felt that that was the time to begin the use of salicylates. In a few private cases I have put the patient on large doses of salicylate at the very start, giving ten grains every hour for twelve hours, and then, after omitting for twelve hours, ten grains an hour for another twelve hours. The first case I treated in this way had a very slight fever for about five days, in spite of the fact that there was complete consolidation of a whole lower lobe. I have never had so light a case of croupous pneumonia. The second case I got at the end of eighteen hours. I put him at once on the above mentioned course of the salicylates. There was a crisis at the end of forty-eight hours from the time the treatment was begun, a little less than three days from the original chill—a crisis which ended the disease completely so far as the rational signs were concerned. I could mention a few more cases, but these

two are instances of what this treatment will do, and I merely wish to say that it seems to me that the salicylates really offer some hope of being a specific remedy in this affection. I wish some of you would try it in the very early stages, and don't be afraid to give the salicylate in large doses; I do not believe that either in pneumonia or in rheumatism this drug has any dangerously depressant effect upon the heart.

Dr. E. C. Hill—We have all used the salicylate of sodium in the treatment of pleurisy. We have also used it in the treatment of rheumatism. As a matter of fact, the salicylate of sodium is a good remedy in many infectious diseases, partly for the reason that salicylic acid is an antiseptic, and partly because of the alkali sodium. I believe that is all there is to this treatment. It is on the same principle that Skene and other surgeons now use bicarbonate of sodium in the dressing of wounds. The alkali prevents or antagonizes infection by increasing the alkalinity of the blood which is subnormal in all infections, particularly in rheumatism and pneumonia.

DIET AS A METHOD OF DIAGNOSIS.

BY C. D. SPIVAK, M. D., DENVER.

A physician should cultivate the qualities of an expert detective; should aim to possess the analytical mind of a Sherlock Holmes. One need not ask his patient whether he is poor or rich, coarse or refined, whether he kills his time at the green table or uses his leisure hours for the development of his intellect. A glance at the face, nose, hands, finger nails and the gait; the extent of the vocabulary he uses, the formation of the sentences, the pronunciation of the words furnish sufficient data for answering all the above mentioned queries and many more besides. Gerhardt has recently published a pamphlet, "The Hand in Disease," which is a masterpiece of medical detective

work, and it is to be hoped that it will be followed by a series on the eye, nose, mouth, lips, etc., etc., in disease.

I wish to briefly outline in this paper the diagnostic value of diet. There is a deep meaning in the German saying, "Der Mensch ist was er isst," which may be freely translated, "Tell me what you eat and I'll tell you who you are." One will tell you that sauerkraut and beer predominate in his diet—don't hesitate to designate him as a Teuton. One who mentions potatoes with a sort of veneration is sure to have come from the green island. One who speaks of caviar and vodka may be put down as a subject of the czar. If rice and maize are the chief articles of subsistence, the differential diagnosis lies somewhere between a Chinaman and a Spaniard. If animal food is consumed in large quantities you will not be far from the mark by putting him down as either American or English. Large quantities of food and drink are taken by workingmen, butchers, cooks, beer brewers, gluttons and idiots; by those suffering from a dilated stomach (first stage), hyperacidity and nervous dyspepsia. Anorexia, the complete absence of the feeling of hunger, is an expression of some nervous disturbance, and occurs mostly in the young, among the well-to-do classes, and predominates in women. There may be a pseudo-anorexia, the patient fears to take food on account of the distress it causes. The cavity of the mouth, the oesophagus, the stomach or the intestines may be at fault. Anorexia, if persistent and not amenable to treatment, should be an indication for a thorough examination of the lungs. Anorexia is a forerunner of tubercle-bacilli. The opposite of anorexia—boulimia, the absence of satiety—is, in the majority of cases, of nervous origin; one should, however, look out for round ulcer, tapeworm, disease of the sexual organs and disease of the brain. Abnormally large quantities of food are taken by dietetics and convalescents from exhausting diseases; and those suffering from hysteria, epilepsy, hydrocephalus and tumor of the brain will consume astonishingly large quantities.

You can astonish your patient who eats at the lunch counter by your clairvoyance. Tell him he suffers from pressure and distention at the pit of his stomach after meals, that he feels languid and sleepy, that he is most of the time constipated and has

an occasional attack of diarrhea. Ask one who does not exercise his teeth and salivary glands—the "bolter"—whether he suffers from water-brash and occasional attacks of nausea. You can assure him who subsists upon stews and chops and cutlets, to the exclusion of fruit and starches, that you *know* his bowels are "tied up." Of course she—the candy-and-ice-cream miss—goes often to the toilet room.

But here is the rub. Patients may be divided into two great categories—observers and non-observers. Some will be able to give direct and clear answers to your interrogation, and these will be, as a rule, the women folk. Others will be hazy even about their morning meal. There are but few who can state what articles of food agree with them or not; whether they eat more starchy than proteid food; what is the quantity of water they drink in the twenty-four hours; what amount of sugar they use in their food; whether the pain or distress or diarrhea depends upon the taking of food in general or a particular article of food; whether the annoying symptoms appear five minutes or two hours after meals, and whether they last for a long or short period. Each one of the above questions—and I could lengthen the catalogue ad infinitum—has its import. It is absolutely impossible to make a correct diagnosis and institute proper treatment unless all the questions are answered with precision and certainty. The stomach tube, the reagents, the gastrodiaphane and even the gastroscope are of no avail when you don't know *what* ails him and *when* it ails him. The subjective symptoms are of greater diagnostic value in gastrointestinal disorders than the subjective symptoms. Palpation without interrogation is misleading. A married woman who has lost her menses for several months and has a distended abdomen is probably pregnant. One who has pain immediately after meals, lasting for two or three hours, suffers, in all probability, from ulcer of the stomach. But our patient "wears his brains in his belly and his head in his guts;" he is unable to give us reliable data, and therefore we are not able to make our diagnosis at the first visit. This is what I want to emphasize: Make your patient understand that just as long as he will be uncertain about certain points so long will the diag-

nosis be obscure. Let the patient understand that it takes time to make a correct diagnosis. Let him go home and watch his symptoms for a few days. Write out just what you want him to find out. Let him eat the first day the usual meals and report the day following all the symptoms he has noted. Then put the patient for one day on a milk diet, the next on a meat diet, the next on a mixed diet without fruit, then with fruit and so on. At the same time you can make the physical examination of the patient, the chemical, macroscopical and microscopical examination of the stomach contents, saliva, urine and feces. It may take several days, nay a week or two before you make the diagnosis, but it will be time well spent. You won't have to revise the diagnosis and then revise the revision. Not only are these diet tests valuable as diagnostic points, but they are in the majority of cases helps to the future treatment. For the diet which according to our judgment should be most suitable proves, when put to a test, quite obnoxious. It is better that the patient know that this diet is prescribed with a view of testing the stomach than to prescribe a diet as a part of the treatment, and afterward be obliged to change it. It is also advisable in certain cases, especially when ulcer of the stomach is suspected, to order your patient to entirely abstain from food for one, two or even three days.

To summarize.

1. Every patient suffering from gastrointestinal trouble should be interrogated in the minutiae of his diet, and the probable relation of his disease to the diet.

2. Since, as a rule, the answers are not satisfactory, therefore institute diet tests for as long a period as it will be necessary to elicit all the required data.

3. Impress upon your patient the fact that it is impossible to make a snap diagnosis. You may, at the first visit, suppose, guess, surmise, suspect and presume as to the nature of the malady, but it will be for his benefit if he waits patiently until you *know* the cause of his trouble.

DIURETICS IN RENAL DROPSY: THEIR INDICATIONS AND USES.

BY E. R. AXTELL, M. D., DENVER.

A striking symptom of that peculiar complex of symptoms which we call Bright's disease is dropsy. It is a symptom that the patient usually notices and calls attention to. It is by no means present in every case of renal disease. It is usually present in acute nephritis, but we have all seen cases where it was very slight or absent. Where acute nephritis complicates pneumonia, typhoid fever or diphtheria, it is usually absent.

In the form of subacute nephritis, and in that form where the kidney is large and white, dropsy is very common, being absent in only eight or ten per cent.

In the interstitial form dropsy is much less common. In the early stages of the form it is generally absent, in fact almost never occurs, but later on it may appear—and this usually from cardiac failure.

Dropsy is simply a name for an accumulation of watery fluid in the lymph spaces of the subcutaneous cellular tissue and in the serous cavities of the body.

This watery fluid is lymph and is derived from the capillaries. Under normal circumstances it is poured out into these spaces, but as fast as it is poured out it is taken up by the venous and lymphatic radicles.

There are two essential factors necessary for the production of dropsy, and they do not seem to have an absolute relation to the condition of the kidneys. First, there must be an increase in the outflow of fluid; or, second, there must exist a failure on the part of the veins and lymphatics to take up the effused fluid.

It is not my province to enter into the physiological facts and experiments which have been made in this line. I think our present knowledge of the pathology of dropsy can be embraced in the following summary, which is modified from Saundby:

First—Dropsy is an accumulation of lymph or watery fluid in the lymph spaces of the body and serous sacs as a consequence of (a) defective pumping arrangements, on account of which fluid

accumulates; (b) changes in the blood and capillaries by which the outflow of fluid is increased.

Second—Dropsy is present in most cases of acute and subacute nephritis.

It is present in about ninety per cent. of cases of large white kidney.

It is present in only about ten per cent. of cases of uncomplicated contracted kidney. In the late stages of this disease it is more frequent, being present in twenty-five per cent.

Third—In uncomplicated contracting kidney dropsy is due to heart failure; but in acute nephritis and its sequelae it is due to more obscure causes in which a watery state of the blood is accompanied by increased permeability of the capillaries, caused possibly by the presence of an acid or other toxic substance in the blood.

This introduction is to serve for the very limited field which I have taken for this paper. In dropsy we do not confine ourselves to diuretics—medicines which increase the secretion of the urine—we use diaphoretics and hydragogue cathartics; but I am not to consider in this paper the treatment of dropsy, but simply the use of diuretics in this condition.

We all use in renal dropsy, at some time or another, diuretics. I believe much harm may come in their use unless they are judiciously chosen.

We have diuretics divided into two classes: the direct and the indirect.

To the first class belong all medicines which produce an increase of diuresis by influencing the kidneys directly.

To the second class belong all medicines which produce an increase of diuresis by augmenting the general blood pressure. This means, of course, their action on the heart, whose energy is increased. Diuretics of this class do not act on the kidneys. They are incapable of augmenting the flow of urine when they fail to increase the force of the heart's action. When given to a healthy man or woman they do not markedly augment the quantity of the urine, simply because the blood pressure is generally at its maximum height. Given, however, in a case where there is insufficient heart action and a small flow of urine, they often in a short time produce copious diuresis.

We could consider in elaborate detail the question of urinary secretion, but it is not necessary in an elementary paper, as this professes to be.

We know a few fundamental facts as regards the influence of diuretics upon the kidneys. Any medicine which increases the flow of urine by a direct action on the kidneys causes a more or less active hyperaemia, with increased activity on the part of the renal epithelium.

Some of the direct diuretics, when given in large doses, so augment the hyperaemia as to render the urine bloody and albuminous.

If we seek to understand the frequent occurrence of dropsy in renal diseases, we have then these solutions: The main function of the kidney is to excrete water from the body; if, because of disease, this task can be no longer fulfilled, or only in part, it accumulates elsewhere and dropsy results. To this we have added Cohnheim's theory—that there is an increased permeability to the blood vessels.

Clinical experience seems in general to agree with these solutions. Oedema in renal disease seldom appears until the daily amount of urine has been below the normal for some time. In those cases of renal disease where a large amount of urine is passed, or where even the urine is normal in amount, oedema is usually wholly absent.

It is the rule that where we have dropsy, and where there follows an increase in the amount of urine, the dropsy diminishes, and, conversely, little urine means more dropsy.

We practically have direct diuretics divided into two classes, the saline diuretics and the stimulant diuretics. The salines take their name from the fact that they change the reaction of the urine, rendering it less acid or even alkaline; while the irritant or stimulant diuretics, when administered in excessive doses, diminish the quantity of urine and produce symptoms which show renal irritation or inflammation.

The saline diuretics are those mostly used and recommended in the dropsy of acute nephritis.

The acetate of potassium, the citrate of potassium, the bitartrate of potassium, or these salts of sodium, lithium, calcium

or magnesium, are all used. It is recognized now that the salts of potassium cause a more decided diuresis than the other salts mentioned, and they are preferred when an increase in the amount of urine is demanded. Of this salt the acetate, citrate and bitartrate seem to possess equal diuretic power. This is probably due to the fact that before reaching the kidney they are all converted into the carbonate and eliminated as such.

This salt in its elimination excites the renal epithelium to increased activity. An active hyperaemia results and there is an increased flow of watery urine.

In renal dropsy the saline diuretics are frequently used, and apparently without discretion. They may be useful, but they may be very harmful. In the dropsy of an acute nephritis saline diuretics do harm as long as the inflammation of the kidney is the cause of the diminished secretion of the urine. An inflamed kidney must not have its epithelium stimulated to increased activity; an artificial hyperaemia must not be added to acute congestion. So harmful may saline diuretics be in acute nephritis that they may hasten the appearance of uraemic symptoms.

I contend that all diuretics should be withheld in acute nephritis until the acute inflammation has subsided. This means that a period of one or two weeks ought to elapse before they are given.

When the inflammation has subsided and there exists a scanty flow of urine, due to the presence of tube-casts and masses of blood in the uriniferous tubules, then these saline diuretics are useful by hastening the removal of these impediments. The proposition is this: The salines may do a little harm, but the collections of foreign material in the uriniferous tubules will do more harm if they are not removed. On the passing of more urine, the dropsy often goes away slowly and steadily.

In the dropsy of chronic renal disease I have never seen the saline diuretics do much good. They may increase diuresis, but they do not lessen dropsy. Certainly in any case of chronic renal dropsy one would not be justified in using the saline diuretics for any length of time. If the damaged kidney can not secrete water, it can not eliminate these medicines. In this way we could do harm.

The stimulant diuretics are frequently recommended in the most careless manner for renal dropsy. Take up almost any text book and the list of diuretics to use is very great, and this without any apparent reference to whether harm can or can not result from their use.

It is true that in many cases of dropsy we get to a place where the question is What is next? and where one sees the great need of a drug that will make remaining kidney tissue do its work actively and help out. It is in such cases that we are privileged to use renal diuretics, but not until diaphoretics and hydragogue cathartics have been tried. That is the fundamental consideration.

I mention here the usual drugs recommended for this condition—it is my intention to consider each briefly: Scoparius, squill, caffeine, pilocarpine, digitalis, diuretin, sweet spirits of nitre and calomel.

Let us take up scoparius. This is a stimulant or irritant diuretic and occupies a high place among the active diuretics of English physicians. It is recommended for renal dropsy in several American text books.

It can be used late in any renal dropsy. It decidedly augments the urinary secretion and sometimes the action of the bowels. It is employed in the form of a decoction, containing one part in twenty. Of this decoction the dose for an adult is two ounces every three to six hours. It is frequently combined with squill.

Scilla: Squill is generally conceded to be contra-indicated in acute nephritis and all forms of Bright's disease. It is, however, a diuretic of some power, and is classed among the indirect diuretics, it having been shown that its diuretic action takes place in consequence of a modification of the heart's action. Late investigations have shown that toxic doses produce in animals no marked changes in the kidneys. Although squill is such a diuretic, yet when it comes to removing renal dropsy it seems to have but little influence. I can not from personal experience recommend its use in renal dropsy.

Caffeine citrate in renal dropsy was first recommended by Prof. Gubler, who asserted that it was a powerful diuretic. His claim has been confirmed clinically many times. It is not to be

used in acute Bright's, but can be used in chronic Bright's in doses of three grains every three to five hours. It apparently has a direct diuretic influence, as well as influencing the heart. Caffeine when injected into the blood affects blood pressure but little. It causes dilatation of the renal vessels after a passing constriction and an increase in the flow of urine after a temporary diminution. It is often uncertain in its action. It will work nicely one time, and be of no service at another. It is worth a trial when other things have failed.

Pilocarpine hydrochlorate is nowhere classed as a diuretic, but some recent experiments of H. C. Wood (?) indicate that it stimulates the kidneys. He says: "There is some clinical experience in favor of the plan of giving pilocarpine in doses of $^1/_{10}$ of a grain three times a day, so as to avoid any violent action upon the skin and get a decided increase of the urine."

Digitalis has, in the opinion of H. C. Wood, direct diuretic properties. He says: "The diuresis of digitalis is not simply a result of its action on the circulation, since it will sometimes appear before the circulation is sensibly affected. At the same time it is very evident that in disease the good effect of digitalis upon the renal organs is often in large measure due to its action upon the heart, but it is of value as a direct diuretic in renal dropsy both in the subacute and the chronic form, and while it frequently fails in these varieties of Bright's disease, yet it should always be tried."

It may be given in three forms—fluid extract, tincture or infusion. The dose of the fluid extract is one, two or three minims every two or three hours, according to the urgency of the case or to the readiness with which the patient responds to the drug. This is always a variable factor. The tincture can be given in from ten- to thirty-minim doses every two or three hours.

The officinal infusion, in doses of from one to three teaspoonfuls, is perhaps the best and most efficient form in which the drug can be administered, but it is at the same time the most trying to the stomach. Indeed, this drug in any form is apt to nauseate, and where we have this symptom present from a toxaemia we are often deprived of the use of this valuable drug.

Digitalin has not in my hands given me the results that I get with the infusion.

Diuretin was the name given by Dr. Christian Gram, of Copenhagen, to the salicylate of theobromine and sodium which he introduced as a substitute for caffeine. Extensive clinical experiments with the drug showed its diuretic action. It is a white powder, with a slightly bitter and disagreeable taste, and is very soluble. Its solution is very unstable and it rapidly decomposes. This drug exerts its diuretic properties by a direct action on the secreting tissue of the kidneys. It acts promptly and energetically. Its effect is continued for twenty-four or thirty hours after the cessation of the drug. It increases both the solids and fluids of the urine.

In all forms of dropsy due to renal disease, where a diuretic is demanded, diuretin can be used. There is certainly but little irritation to the renal epithelium, and very few bad results have been reported from its use. It may occasionally produce slight intestinal irritation and it has been known to cause slight delirium, but it is probable that in these cases the dosage was unnecessarily large. Its early dosage was larger than it is at present. Sixty to ninety grains daily was recommended. The best method of giving the drug is in ten- to twelve-grain doses, three times a day at first. Increase to thirty-grain doses if necessary. It is to be given in water with some aromatic essence, like essence of peppermint, to disguise its bitter taste, and always when the acidity of the stomach is at a minimum—three or four hours after meals. When it fails in a case of renal dropsy, a combination of diuretin and digitalis should be tried before it is discarded.

I have used diuretin many times in renal dropsy with scanty urine, and I have seen urine increase from twenty ounces in twenty-four hours up to 146 ounces in the subsequent twenty-four hours.

I have never noticed any change in the circulation from its use, and although I employed it for a long time in two cases of renal dropsy, yet it did not seem to increase the arterial pressure at any time.

Diuretin has been used with good results in the renal dropsies of children, and R. Demme says that in the dropsy of scarlatinous nephritis, after the first stage of the disease has passed, diuretin will remove the dropsy more rapidly than any other diuretic.

The dose for children from two to five years old was three to fifteen grains daily; from six to ten years old, fifteen to forty-five grains daily. Knoll's diuretin is probably to-day the most reliable drug on the market. Some poor results no doubt are due to the product used. Of course, where renal epithelium has undergone too extensive degeneration, the drug may fail.

Spiritus aetheris nitrosi has a reputation as a diuretic in renal dropsy, but it is ill founded, for it is not sufficiently powerful, even in large doses, to make it worthy of reliance.

Calomel long ago was observed to have a diuretic power, but this sems to have been forgotten during the past twenty years. Its consideration as a diuretic is most interesting, but a long line of clinical observations show that in renal dropsy it has almost no power.

In cardiac dropsy calomel produces marked diuresis and helps greatly, but in renal dropsy it acts very feebly or not at all.

There have been several new remedies proposed lately for renal dropsy, of which fuchsin and apocynum cannabinum are the most promising, but I have had no experience with either drug and I can not say anything as to their value.

There are a great many remedies which stimulate the kidneys and have in a limited way a diuretic action, but most of them are too irritant to be used in diseased kidneys and are too feeble in action to be of any value. We can dismiss most of them by putting them in this list: Pipsissewa, copaiba, cubeba, buchu, uva ursi, pareira, taraxacum and cantharis, juniperus and terebintha.

THE URINE IN THE DIAGNOSIS AND PROGNOSIS OF NON-URINARY DISEASES.

BY E. C. HILL, M. D., DENVER.

We judge most certainly the condition of a living organism by comparing its intake and its output. The urine is the chief index of metabolism in the human body, and its quantitative examination furnishes clinical evidence of the greatest practical value. Its systematic study in our patients affords accurate data

otherwise unobtainable and serves to round out an exact diagnosis and a definite prognosis, with the best treatment as a corollary. In this brief paper, founded mainly upon the chemic and microscopic investigation of something over 6,000 urines, it is my purpose merely to emphasize a few of many points of utility to progressive physicians. For the sake of convenience, the subject will be considered according to disease classes.

Specific Infections—During the febrile stage of all fevers the urine is diminished in quantity and highly acid. The specific gravity is more than correspondingly increased, owing to absolute excess of urea depending on augmented tissue waste. Uric acid is increased proportionately even more than urea, and uratic deposits are common. The excretion of chlorides and phosphates, except in spotted fever, is diminished until the beginning of convalescence. Pigmentation is deepened because of hemolytic changes, and bile pigment is not infrequently present, particularly in smallpox. Hemoglobinuria is indicative of decided destruction of red blood corpuscles; it accompanies severe infections and is a valuable premonitory sign of scarlatinal hematuria and nephritis. Albuminuria is observed at one time or other in the majority of cases of fevers generally, but is usually slight in quantity unless nephritis complicates. Albumosuria is occasionally noted, particularly in pyemia and cerebrospinal meningitis, and a trace of glucose is not uncommon. Hyaline casts are frequent even without supervening nephritis—in the event of which occurrence we find also epithelial, red blood, leucocyte and granular casts. In my experience chronic pyelitis is a much more frequent sequel of infectious diseases than is chronic nephritis.

The special color test of typhoid urine known as Ehrlich's diazo-reaction has been ranked by the Lancet as of equal value with Widal's agglutination test. It occurs a day or two earlier than does the serum reaction and it serves quantitatively for prognosis, whereas the serum test is said to have no prognostic significance. The diazo-reaction is of special use in differentiating enteric fever from simple enteritis and allied complaints. It is likewise met with in miliary tuberculosis and in severe cases of measles, scarlatina, erysipelas and pyemia, as also in

cases of ordinary phthisis which are rapidly progressing to a fatal termination. In all these instances its occurrence is chiefly an item in prognosis.

Hemic and Circulatory Disorders—The relative value of the *vis a tergo* is the all-important factor in the causation of the urinary changes of circulatory origin. When cardiac hypertrophy exists and compensation is maintained there is absolute increase of both the water and the solids of urine. Failing compensation is marked and measured by decrease of the solid ingredients and by the presence of albumin and hyaline casts, both of which may be made to disappear for a time under the administration of digitalis or other heart tonics. Much the same picture as to the urine presents itself in the secondary cardiac dilatation of valvular disease and in arterio-sclerosis and the various myocardial degenerations.

Concerning blood changes proper: Hematuria, apparently spontaneous, is of rather common occurrence in purpura hemorrhagica, hemophilia and scurvy. A pale, abundant urine deficient in normal solids is a feature of chlorosis and anemias. In progressive pernicious anemia indicanuria is a prominent sign. A small amount of albumin may be encountered in any of the blood dyscrasiae as well as in degenerative lesions of the ductless glands. Remembering the nucleinic origin of uric acid, a great excess of this ingredient in the urine of leukemia is not surprising. Ulcerative endocarditis and hidden pyemic foci may discover themselves first by renal infarcts, with sudden pronounced albuminuria and blood and pus casts.

Respiratory Diseases—The chlorides show a reduction in all dyspneic conditions, particularly in pneumonia and capillary bronchitis. The excessive excretion of chlorides following retention is a more definite sign of resolution than even the fall of temperature by crisis or lysis. Urea and sulphates are markedly increased except in grave cases, and the urates are enormously augmented. Albuminuria is present in nearly one-half of all cases of pneumonia, and these yield a mortality three times as great as in non-albuminuric patients. Albuminuria is a distinctive feature of the absorption stage in pneumonia and pleurisy with exudation. The urine of phthisis is very variable. It is

usually increased in quantity until near the fatal end. Albuminuria is the rule, but the quantity is slight except in amyloid renal lesions, which are comparatively rare. The urine of emphysema is also likely to contain albumin, owing to circulatory obstruction.

Gastro-Intestinal Diseases—In organic disease of the stomach and intestines the urine, as a rule, is diminished in quantity, the diminution amounting to suppression at times in the various forms of cholera, in appendicitis and acute obstruction. The reaction is frequently neutral or alkaline, with resulting precipitation of phosphates, or "phosphaturia." The normal digestive curve of acidity is always deepened in gastrosuccorrhea, but is absent in atrophic gastritis and cancer of the stomach. Intestinal indigestion is characterized by deposits of urates and oxalates. Albuminuria, attributable to autointoxication, is not seldom to be found, and albumosuria is often present in ulcerative conditions. Next to pus, an excess of indoxyl potassium sulphate, or "indican," is to me the most familiar pathologic feature of urines. This indicanuria signifies, as a rule, albuminous putrefaction in the alimentary tract, and the indications for intestinal antiseptics and laxatives are plain. In acute or chronic intestinal obstruction the excess of indican is apt to be enormous, and it is likewise marked in general peritonitis. Hydrothionuria naturally gives rise to a suspicion of fecal fistula, but the same sewer gas odor may be developed by certain microörganisms introduced *per vias naturales.*

Hepatic and Pancreatic Lesions—In all liver lesions the urine is highly acid and deeply colored. Bile pigment is commonly present in considerable amount. Urea is more or less diminished, being nearly absent and replaced by ammonia in acute yellow atrophy.

Uric acid is increased, while the chlorides are diminished in direct proportion with the ascites. Albumin is seldom noted except in cases secondary to cardiac lesions and in syphilitic, tubercular and amyloid liver. A trace of sugar is not infrequent. In obstructive jaundice choluria is evident both before and after the appearance of icterus in the skin. The choluria of cholelithiasis is of distinct service in differentiating hepatic

from renal colic and other abdominal pain. Leucin and tyrosin are occasionally noted in various hepatic disorders, as well as in defective intestinal digestion, but they are much more abundant in acute yellow atrophy. A striking character of the later stages of hepatic cirrhosis is the coincidence of a urine dark in color and light in weight—always a sign of grave import.

Chronic pancreatitis is marked by polyuria, glycosuria and lipuria. There may be albumin or glucose in the urine of patients with pancreatic cysts. Lipuria is also observed in cancer of the pancreas, and diabetes mellitus may supervene.

Osseous, Articular and Constitutional Diseases—The urine of acute articular rheumatism is typically pyrexial, with high color, density and acidity, great excess of urea, sulphates, and urates, and diminished chlorides. Albuminuria is transient and slight. The most marked feature of gouty urine is the nearly constant reduction, from retention, of uric acid and phosphates, with periodic storms of excessive excretion immediately following acute exacerbations. This condition is frequently associated with oxaluria and with chronic interstitial nephritis. In tubercular joint disease with abscess formation, the presence of albumose in the urine may aid in a correct diagnosis. In gonorrheal arthritis careful examination of the urethral secretions will usually reveal the gonococci. Rachitis and osteomalacia are both distinguished by great excess of earthy phosphates, chronic articular rheumatism and diffuse periostitis by less marked increase. Fat in the urine is commonly observed after fracture of the long bones, and the return of the earthy phosphates to a normal daily amount, after previous excess, is a certain indication that bony union is complete. Glycosuria is frequently present in acromegaly. The urine of lithemia is scanty, sharply acid, high colored and uratic during the attacks. There are occasionally slight albuminuria, cylindroids and hyaline casts. The lithemia of infants is manifested by a deposit of red sand on the diapers. Muscular rheumatism is sometimes accompanied by oxaluria. In simple atrophy, or marasmus, the urine is often milky from white urates, fat and mucus, and albumin or sugar may be present.

Nervous Diseases—Hysteria is noted for the large amount of watery urine which, as a rule, accompanies or follows the

seizure; but on the other hand there may be suppression lasting for days. Transient polyuria is also observed after epileptic fits, attended at times by a little albumin. In neurasthenia the urine is constantly deficient in normal solids. In melancholia the urine is often deficient in quantity. Oxaluria often shows itself clinically by intestinal dyspepsia, lumbar aching and nervous irritability and depression. Phosphaturia is a frequent accompaniment of nervous debility. In chorea we have an increase both of urea and of phosphates. Migraine is marked toward the close of the attack by an abundance of uric acid and allied products. Glycosuria is of frequent occurrence in medullary lesions. Surgical shock, particularly when due to rectal or genito-urinary operations, is likely to be joined with urinary suppression or retention. Retention, usually with overflow, is commonly present likewise in organic spinal lesions.

In meningitis and other high grade nerve inflammations the earthy phosphates are greatly in excess. Time permits here the mere mention of the three forms of diabetes—mellitus, insipidus and the phosphatic form. In this latter, in addition to the usual clinical symptoms of ordinary diabetes, we find the urine loaded with alkaline phosphates in place of sugar.

Skin Affections—Obviously a study of the urine is not often needed in skin diseases proper, so far as concerns diagnosis, yet in seeking the primary cause we will sometimes get valuable points in this way concerning defective metabolism. Eczema, psoriasis and a number of other lesions seem, from the urine, to be forms of lithemia. Hematuria is noted after severe burns and occasionally in Raynaud's disease.

Surgical Disorders—Abdominal tumors may, and often do, give rise by pressure to albuminuria. The occurrence of melanin in the urine is pathognomonic of melanotic growths. In perirenal inflammation the nuclei of the renal cells are often multiple, as I have observed in a case of lumbar abscess. Internal pus formation in any part of the body is indicated by albumosuria; the resorption of hemorrhagic exudations by hemoglobinuria. A considerable relative increase of urinary nitrogen over phosphoric oxide is said to be a sign of malignancy.

Poisons—Corrosive poisoning in general is attended by scantiness or suppression of urine, and the same is true of arsenic

and belladonna in toxic doses. In acute phosphorus poisoning the urine, if not suppressed, is bloody, fatty, and albuminous and contains crysals of leucin and tyrosin. Turpentine, cantharides and other renal irritants, illuminating gas, arsenious vapors, coal-tar derivatives and other corpuscle-destroying agents frequently give rise to hemoglobinuria or hematuria. The blackish-green color of the urine and characteristic odor of carbolic acid are highly suggestive of poisoning by this drug, which is not seldom the result of its free and careless topical use.

Chronic mineral poisoning is characterized, as a rule, by scanty urine and deficient urinary solids. Albuminuria is frequent and chronic interstitial nephritis is a not very unusual sequel. The detection of lead, mercury, arsenic, copper, etc., in the greatly concentrated urine furnishes incontrovertible evidence of the *causa morbi*. This test is most certain when preceded by the administration of potassium iodide for several days.

THE INTESTINAL NEUROSES.

BY WM. J. ROTHWELL, M. D., DENVER.

Under this heading are included those morbid processes in the intestines which are not due to any demonstrable organic change either in the viscera themselves or in their nerves.

As is well known, intestinal innervation takes place through the vagi and the splanchnics—the plexuses of Auerbach and Meissner acting as the distributors of nervous influence.

That the excito-motor fibres for the musculature of the intestines pass through the vagi is shown by the fact that irritation of these nerves excites peristaltic movements. The power of inhibiting these muscular movements must be in the splanchnic nerves, since irritation of the latter invariably inhibits peristalsis. Since irritation of the splanchnics produces anaemia and section hyperaemia of the intestinal blood-vessels, the vaso-motor nerves must be contained in them.

While we know little about the secretory and sensory nerves of the bowels, there is no doubt that they have the same course as the inhibitory and vaso-motor nerves.

The functions of all or any of these nerve groups may be disturbed primarily, secondarily or reflexively. They are often primarily affected in such general neuroses as hysteria, neurasthenia and hypochondriasis. The visceral crises of locomotor ataxia and the spastic state of the longitudinal and circular fibres in cerebral miningetis are secondary phenomena.

Chronic constipation or diarrhœa promptly relieved by the cure of an ulcerated os may safely be classed as reflex neuroses.

This paper will be limited to a brief study of the primary intestinal neuroses. They consist in disturbances of motility, sensibility and secretion.

The irritability of the motor nerves may be increased, diminished or abolished. There is a form of peristaltic restlessness dependent upon an excessive irritability of the motor nerves of the small intestines. It occurs for the most in neurotic women. There may be associated with it also a similar restlessness of the gastric musculature. The peristaltic movements are so much increased as to produce rumbling, gurgling, croaking or squeaking noises in the bowels, distressingly audible to the sufferer and embarrassingly so to those around her. In persons with thin abdominal walls they are often visible and palpable. Emotional excitement is especially apt to set these peristaltic waves in motion. They are, therefore, very annoying in social life. For a similar reason, when such patients consult a physician the noises are easily audible. That the increased mobility does not extend downward beyond the ileo-caecal valve is evident from the fact that these noisy movements are never immediately followed by alvine discharges, which would certainly take place were the colon simultaneously involved.

On the contrary, such patients usually suffer from constipation as a part of the general nervous condition. These stormy movements are usually painless, but when there are in addition impaired intestinal digestion and gaseous distension of the bowels they often cause twinges of pain.

There is another affection, depending upon a more pronounced irritability of these motor nerves, in which the exaggerated peristaltic waves do not terminate at the valve of Bauhin, but extend into the colon and upper rectal region. In this case

they are always followed by precipitate bowel movements, at first solid and afterwards semi-solid or liquid. A very trifling excitement may be sufficient to start the morbid process. Any psychic disturbance whatever may serve to liberate these impulses. Fear, anxiety, or the receipt of a telegram may be followed by frequent bowel movements. One suffering from this neurosis, finding himself where there are no conveniences for his natural wants, becomes anxious in consequence, and is at once attacked with nervous diarrhœa.

These spasmodic involuntary discharges of motor nerve force in the intestinal tract seem to me to be quite analogous to the nerve storms of hysteria and epilepsy, notwithstanding the great difference in their clinical manifestations. In both there are abnormal irritability of a part of the nervous system, involuntary discharge of motor force, and spasmodic muscular contractions.

Another disturbance of the motor innervation of the bowels manifests itself in a concurrent spasm of both the round and long muscular fibres. Normal peristalsis is the result of alternating motor impulses to these two sets of fibres acting in such a way as to inhibit the action of the circular fibres while the longitudinals are contracting, and vice versa. In the disturbance in question both sets of fibres contract simultaneously and remain in a spastic state as long as the exciting cause continues. This enterospasm necessarily diminishes the lumen of the affected segment of the bowel, and checks the onward progress of its contents which are held in the grip of the contracted part and which also accumulate above it. I have seen several of these cases of spastic obstipation with colicky pains and a doughy fecal tumor discoverable by palpitation at or near one of the flexures of the colon.

The following is cited as a case in point:

Visited Mr. S. T., 815 Eighth street, this city, on April 29, this year. Found him suffering from obstruction of the bowels. A physician had for three days been trying to relieve him by cathartics, enemata, etc. He had severe pain, a retracted abdomen, frequent vomiting, but not stercoraceous. No marked fecal tumor discoverable, but the pain and tenderness were most pronounced at the left flexure of the colon.

All purgations were discontinued, a warm poultice applied, morphia given hypodermically, and six minims of the deodorated tincture repeated every two hours. After twelve hours of this treatment the administration of a simple enema was followed by copious evacuations, at first consisting of small, hard, cylindrical masses, and afterwards of liquid feces. The relief was sudden and permanent. We have all read of the cathartic action of opium in certain supposed idiosyncracies. In spastic obstruction opium relaxes the spasm and permits peristalsis; this is the condition, I think, in which opium is supposed to act as a cathartic.

In ordinary colic there is a spasm of both muscular layers of the bowels, but it is usually of short duration. There is not necessarily any increased irritability of the splanchnic nerves preceding the attack. The spasm is the result of severe irritation of the sensory fibres by coarse indigestible materials, or accumulations of gas in the bowels, and is a pure reflex from the sensory to the motor nerves of the bowels.

Opinions differ as to the origin of the severe cutting pains of colic. They might be caused by primary irritation of the sensory nerves by the offending material in the bowel, or by compression of these same nerves between the tetanically contracted muscular fibres. The pain is very likely due to pressure, for it is very like in character to that caused by cramp of the sural muscles, and antispasmodics, by relaxing the spasm, relieve it just as completely as anodynes.

As already mentioned, there is a rich plexus of sensory nerves in the intestines. They are subject to the same functional disturbances as this class of nerves are elsewhere, viz.—anaesthesia, hyperaesthesia and neuralgia.

We know little or nothing of anaesthetic states of the bowels, because normally they transmit to consciousness no sensation of the processes going on within them. Peristalsis, secretion, digestion, and the downward movements of the intestinal contents, take place unconsciously. Anaesthesia of the bowels can, therefore, have no diagnostic symptoms, but of its existence in hysteria in company with general anaesthesia of the skin and mucous membranes there can be but little doubt.

The lower portion of the rectum is a fortunate exception to the rule above mentioned. Its sensibility is acute, and impres-

sions received by it are promptly reported to consciousness. When its nerves become anaesthetic, as is sometimes witnessed in hysteria, involuntary fecal discharges may occur as in organic diseases of the spinal cord. Involuntary passage of feces by hysterical women has been observed by me, but I can not recall a single case of urinary incontinence in such persons.

Hyperaesthesia of the intestinal nerves may account for the many disagreeable sensations in the abdomen of which neurotics complain. When such a patient complains of a sense of fullness or distension of the abdomen without any meteorism or tympanites, of a sense of soreness without any discoverable organic cause, of disagreeable throbbings, flutterings, etc., we may reasonably conclude that they all owe their existence to hyperaesthetic nerves.

A state of increased excitability of the sensory nerves, accompanied by paroxysms of severe pain, is a not uncommon visceral neurosis. The attacks of pain usually begin in the umbilical region and radiate thence to other parts of the abdomen. The pain is of a boring, pinching or cutting character. The paroxysms may occur at intervals varying from a few days to many months. The intensity of the pain causes coldness of the surface, a feeble and frequent pulse, and vomiting. These attacks of enteralgia so closely simulate acute peritonitis as to be described by some writers for the sake of emphasis as pseudo-peritonitis.

In enteralgia, however, there is no fever, the pain is relieved by deep pressure, and, though vomiting sometimes occurs, there is never obstinate constipation.

It has to be distinguished from the painful and inflammatory affections within the abdomen, such as peritonitis, appendicitis, perityphlitis, and from renal and hepatic colic and lumbo-abdominal neuralgia.

The intraabdominal inflammations are excluded by the absence of fever and the alleviation of the pain by deep, steady pressure.

Lumbo-abdominal neuralgia is unilateral, and there is tenderness on pressure on the corresponding sides of the spinous processes of the lumbor vertebræ and at other isolated points, symptoms absent in enteralgia.

Dermalgia, or hyperaesthesia of the skin over the abdomen, may simulate this condition. But here the pain is superficial, aggravated by slight pressure or percussion with the ends of the fingers, and if a fold of the skin be raised from the abdominal wall and manipulated it is exquisitely sensitive.

Renal colic might be mistaken for enteralgia when the calculus is large, rough, and slow in passage. Such confusion is unnecessary if we recall the diagnostic features of the latter; a pain coming on suddenly in the lumbar region, extending downwards and inwards in the direction of the ureter, accompanied by retraction of the testicle and a frequent and scanty discharge of blood-stained urine, are symptoms which should not be mistaken for enteralgia.

The secretory nerves are also subject to derangement of function, but its visible manifestations are infrequent. A patient of mine, Mrs. G., of Denver, a lady of 45 years, debilitated and nervous, passed at times from the bowels white membranous patches freely soluble in weak alkalies but not in water. The attacks occurred at intervals of a few days and were always accompanied or preceded by severe colicky pain. At the end of six months recovery was complete. This was a typical case of the morbid process which Nothnagel designated as mucous colic —an excessive secretion of mucinoid material coagulating on the inner coat of the bowel and discharged at intervals with colicky pain. The sufferers are usually neurotic females. The excessive glandular secretion is due to disturbed innervation of the mucous follicles. The disease is to be distinguished from membranous enteritis, in which the shreds are fibrinous—an inflammatory exudate.

Treatment. Since all these functional disturbances depend upon an underlying neuropathic state, it of course demands our chief attention. I shall not weary you by recapitulating the well known measures employed for the cure of the great neuroses, but shall at once enumerate additional remedies for individual cases.

In peristaltic restlessness, in addition to the general treatment, arsenic and methyline blue are especially valuable; the latter in doses of 2 to 3 grains t. i. d.

In enterospasm sedatives and antispasmodics must take the place of purgatives—opium or codeine by the mouth, warm cataplasms on the abdomen and soothing enemata at intervals. In obstinate cases injections of warm oil will render excellent service.

Enteralgia, being a neuralgia of the bowel, is amenable to treatment by anodynes; codeine and morphine are of course indicated. The best result will be obtained by suppositories of the aqueous extract of opium in half grain or grain doses.

Mucous Colic. Of the treatment of this affection, Ewald, in the Twentieth Century Practice of Medicine, writes as follows: "According to my experience there is hardly an affection of the intestines that resists all therapeutic efforts more stubbornly than nervous mucous colic." The indications are: (a) To evacuate the bowels by general laxatives; (b) to relieve pain without narcotics; (c) to prevent fermentation; (d) to counteract a possible autointoxication. To meet the first indication, olive oil or castor oil is recommended. To relieve pain, extract of cannabis indica gr. ¼ in pill t. i. d. As an antifermentative, sodium phosphate, half a drachm to a drachm daily. As disinfectants salol, resorcin, and salicylate of bismuth are strongly recommended.

LEUKAEMIA, WITH ESPECIAL REFERENCE TO THE BLOOD APPEARANCES.

BY G. H. STOVER, M. D., DENVER.

This is a disease, as a rule chronic, marked by an enormous increase in the number of leucocytes in the blood, and attended by peculiar changes in the blood forming organs—the spleen, bone marrow and lymphatic tissues.

Its specific cause is unknown. It frequently arises from no assignable cause; in a fair proportion of cases it has followed chronic malaria, and in a certain number it has been preceded by syphilis. Sometimes there seems to be an etiological connection between this disease and a traumatism of the spleen or bones. From the fact that many cases present an ever-spreading hypertrophy of the lymphatic elements throughout the body, it has

been attempted to place the etiology in a position related to the possible etiology of metastatic malignant growths, but this theory lacks proof. It is also natural that its cause should have been sought for among the infections, but this has no more proof than the preceding theory.

There are certain factors which seem to have an influence in the causation of leukaemia, prominent among them being that of sex; there is a marked preponderance of cases among males, amounting almost to a ratio of two to one. Leukaemia is thought to be more prevalent in European countries than in America. Age seems to be a factor of but little importance, the disease being found from early infancy to middle life, though it is rather more frequent in early life; the lymphatic form is commonest in the young. Leukaemia is found in women subject to sexual disorders, but a causal relation is not generally admitted.

I have said that this is as a rule a chronic disease. There is some dispute regarding the frequency of acute leukaemia, owing to the fact that different writers give different time-durations as determining its acuteness or chronicity. There are undoubtedly cases which may well be called acute, as they run their course in much less than a year, sometimes even in a few weeks. These acute cases occur especially in children.

The average duration of the disease is from one to five years, the larger proportion terminating in from two to three years. It is quite difficult to determine the exact or even closely approximate time of the inception of the malady, for the reason that as a rule the onset is gradual and for some time the patients have been treated upon the basis of incorrect diagnoses, or perhaps have not appealed to the physician at all until late in the disease. Indeed, it is very probable that many of these cases have terminated without a correct diagnosis ever having been made, their disease having been believed to be instances of syphilis, tuberculosis, or chronic malaria.

The prognosis of leukaemia is unqualifiedly bad; subjects of this disease are usually easy victims of intercurrent diseases, though isolated examples of strong resisting power have been noted. There are frequent periods in the history of these cases in which there appears to be an improvement, but this is always illusive, as it lasts but a short time. Among the more frequent

causes of death are hemorrhages, diarrhœa, dropsy, pneumonia, pleurisy and exhaustion.

There are now recognized three varieties of leukaemia—the splenic, lymphatic, and myelogenous. In the splenic form, the enlargement of the spleen is the chief feature of the physical examination; in the lymphatic form, the leading physical evidence consists in the widespread hyperplasia of the lymphatic glands of the body; the myelogenous form is evidenced by tenderness of bone, when there are any clinical symptoms pointing especially to this form. We rarely ever meet with a typical example of either of these varieties; cases usually present a combination of two of them, and often all three of the structures named are more or less involved. The bone marrow is almost always the seat of disease, but it is probably never involved alone. The splenic form is usually markedly complicated by the myelogenous. The lymphatic form may exist practically free from combination with either of the others.

The early symptoms of the disease are of a vague character: There is progressive loss of strength, shortness of breath, palpitation, disturbed appetite and digestion; diarrhea may be quite troublesome. There is often oedema of the ankles, dizziness, headache, a dragging pain in the splenic region. The early symptoms are thus seen to be mainly those of anaemia and malnutrition. Often the earliest sign of serious import is a sudden severe hemorrhage—an epistaxis, or a retinal or cerebral hemorrhage; what practically amounts to a hemorrhagic diathesis may be established. Nausea and vomiting may cause much trouble; the diarrhœa, which is sometimes bloody, is often fatal. The pulse is more rapid than usual and quite weak; haemic murmurs may be heard at the base of the heart; serous effusions occur in the chest or abdomen; the bases of the lungs often become oedematous. The retina is the seat of a leukaemic retinitis, with hemorrhagic deposits which are not of uniform color owing to the large number of leucocytes in the exudate.

The spleen becomes enormously hypertrophied, growing to a weight of even eighteen pounds. The liver is often very greatly enlarged, and is full of lymphatic growths and infiltrations. The tonsils, the lymphatic structures of the tongue and mouth, and

the retro-peritoneal and mesenteric glands are enlarged, and lymphatic growths appear in the patches of Peyer. When the bones are involved the marrow is reddish brown, or even yellow, and may have a puriform appearance; the bones themselves are often rendered rather spongy by an apparent increase in the proportion of cancellous tissue. A tenderness to pressure over the upper part of the sternum is a frequent symptom of bone involvement. A persistent priapism has been noted in some cases, and in women menstrual difficulties are common; strange to say, suppression of the flow is more common than menorrhagia. The enlargement of the glands of the neck, groin, etc., is, as has been said, a prominent feature of certain cases. The urine is about normal in amount, of high specific gravity, and contains an excess of uric acid; albumen may be present.

Toward the close of the disease there is an irregular fever, sometimes accompanied by chills; delirium or stupor may occur.

The diagnosis is to be made from Hodgkin's disease, or general lymphadenoma, by the fact that in the latter disease the general blood count, and especially the differential leucocyte count, are practically normal. Leucocytosis, which sometimes occurs in Hodgkin's disease, never reaches the enormous figure of that of leukaemia.

In splenic anaemia or tumor of the spleen leucocytosis is not present.

In suppurative conditions in which there is high leucocytosis, this does not reach the high count of leukaemia, and all doubt is removed by the differential leucocyte count, which in suppuration shows a very great increase in the polymorphonuclear leucocytes.

Pure tuberculosis, unattended by secondary infection, is not attended by leucocytosis.

In chronic malarial cachexia, where the spleen is enlarged and other symptoms may give a great resemblance to leukaemia, there is also no leucocytosis.

In cancerous or amyloid disease, though there may be some leucocytosis, it does not reach that of leukaemia, and here again the differential leucocyte count is important.

The number of red cells per cubic millimeter is diminished in all forms of leukaemia, and the haemoglobin is also decreased.

While in normal blood the leucocytes average about 7,000 per cubic millimeter, in leukaemia they number from 30,000 to 1,000,000; the lymphatic form has a lower count than the splenomyelogenous.

Instead of the normal ratio of red to white cells, the splenomyelogenous form may have a ratio of one to five, one to three, or even equal numbers of whites and reds, though these extremely high ratios are very rare.

The stained specimen of blood prepared for differential count by the Ehrlich triacid stain, or a modification of it, presents an interesting and beautiful picture.

In the splenomyelogenous form of the disease many of the red cells are nucleated, the nucleus appearing as a round dark body, placed excentrically in the cell; a few megaloblasts or large nucleated reds are found. The characteristic features of the differential count in this form is the presence of a great number of myelocytes, these being cells which are not present in normal blood. They are of varying sizes, most of them quite large, with large oval or circular nuclei taking a blue stain, and the cell body containing many small oxyphile granules. These cells differ from the polymorphonuclear leucocyte only in the fact that the nucleus is always oval or circular, never of the irregular twisted or broken appearance of the latter cell; the granules are the same. Myeloctyes form from 20 to 60 per cent. of the white cells. The relative proportion of lymphocytes, large or small cells with an oval, circular or indented nucleus, blue stained, and having no granules in the cell body, is much diminished. The polymorphonuclear cells are also in lessened ratio, but not to such a degree as the loss of lymphocytes.

The eosinophile percentage is but little changed, as a rule, though they are sometimes increased. Some observers state that the eosinophiles are always greatly increased and form a leading characteristic of leukaemic blood, but this is not correct. The eosinophile is a cell having a nucleus like that of the polymorphonuclear cell, but its granules are fewer in number, quite large, and stain a dark red or bronze. Frequently, the myelocytes contain eosinophile granules.

The blood of lymphatic leukaemia has rather fewer red cells than the splenomyelogenous form, and normoblasts or nucleated

reds are very scarce. The ratio of white to red cells is not so high as in the splenomyelogenous form. The lymphocytes are the cells showing the greatest relative increase; they make up about 90 per cent. of the leucocyte count, as a rule. Myelocytes are present in very small proportion, almost always less than 1 per cent. Eosinophiles are about normal relatively. The percentage of polymorphonuclear cells is extremely diminished.

I report at this time the findings in five cases. The clinical history of some of them has been reported in another paper, by Dr. J. N. Hall, by whom I was consulted in his cases:

CASE NO.	COURTESY OF DOCTOR	FORM	REDS	WHITES	S. M. %	L. M. %	MYELOCYTES %	EOSINOPHILES %	POLYMORPHONUCLEARS %	NORMOBLASTS
2	J. N. Hall	Spleno-my.	.....	Great inc.	4	11	55	0.75	30	Many
3	J. N. Hall	Spleno-my.	.....	Great inc.	9	10	50	1	30	Many
5	Shollenberger	Lymphatic	4,465,000	30,000	61	12	None	1.2	25.8	A few
9	L. Freeman	Spleno-my.	2,610,000	485,000	4	6	50	10	30	Many
19	J. N. Hall	Lymphatic	4,500,000	35,000	32.8	18	1.2	1	47	A few

As to the treatment of leukaemia, there is little to be said. The general condition of the patient is attended to, and symptoms requiring treatment are looked after. Malarial or syphilitic taint should be appropriately treated. Surgery of tumors is absolutely useless, and tampering with the enlarged spleen especially is sure to be fatal. Against the disease itself, we know of no specific.

THE IMPORTANCE OF A KNOWLEDGE OF THE PHYLOGENETIC DEVELOPMENT OF THE CHILD IN THE PREVENTION OF CHILDREN'S DISEASES.

BY E. STUVER, M. D., FORT COLLINS.

In this age of world encircling intellectual activity, in which mind has penetrated so many of the secrets of nature and, by directing its forces, has secured such a great dominion over matter, when the thought and discoveries of the whole world are at the command of each individual worker, we are prone to lose

sight of the fact that while mind controls and directs matter, matter on the other hand exerts a powerful influence on the normal development and integrity of mind.

Surrounded as we are by free schools, almost universal educational facilities and a public sentiment which subordinates nearly everything else to the cultivation of the intellect and rushes the child, scarcely out of the cradle, into the kindergarten and thence through various grades of schools, colleges and universities until he or she emerges at the age of 25 or 30 years a finished product of our modern educational system, we are apt to forget that cultivation of the intellect or cramming the mind does not comprise the whole of development; and indeed that, unless very carefully guarded, by overlooking or ignoring the proper training and development of the body as well as the laws governing the development of the mind in the race, such training may do infinitely more harm than good.

The child, instead of being a "little man," with the same thoughts, feelings, inclinations, capacities and powers—only on a smaller scale—as a man, is in truth an altogether different being; and may be aptly characterized in his various stages of development as an epitome of the development of the race. He passes through the successive stages of savagery, barbarism and semi-civilization before attaining to the full civilization in which we live. During this progress the spectral forms of his dead ancestors surround him on all sides, and the mighty mental accumulations and beliefs of a long forgotten past impress upon him the various stages of credulity, inquiry, faith and full blown reason through which these ancestors have passed.

With these facts fully impressed upon the mind, and thoroughly grasping the great truth that a symmetrical development of all the powers—physical, intellectual and moral—is necessary to the greatest happiness and welfare of the human being, let us see whether our habits of living and educational methods accord with those fundamental laws of development, and, if not, in what way the physician can help to point out the remedy.

As before indicated, the child is not a "*little man.*" In both organization and function there are great differences between the two, and hence their nurture and training should be different and made to conform to their organic and functional capacities.

The glands, heart, lungs, muscular and osseous systems of the child possess a high degree of organic and functional perfection; and this would logically seem to indicate that the proper exercise and development of these various organs is the rational and proper occupation of the child during childhood and early youth. In support of this inference it may be said that in the savage and barbarous stages of development of the race to which the young child corresponds, these organs and functions are developed to a high degree of perfection. Such things as weak, flabby muscles, flat chests, failing hearts and impaired digestive organs were unknown, because their existence would have meant extinction to their possessors. The muscular, osseous and respiratory systems were developed to a high degree of perfection, which was attained, not by disuse and confinement in illy ventilated rooms for a considerable part of the day and the whole night, but by a careful and systematic exercise of the organs undergoing development. But while the physical organization was symmetrically developed and attained a high degree of perfection, and the special senses, especially the sight and hearing, were carefully trained from the earliest childhood until they became phenomenally acute among savage races, the intellectual development in many particulars remained in a rudimentary state. The powers of continuous mental application, abstract reasoning and broad generalization were unknown to the savage, and were only acquired by the race through the slow, gradual processes of evolution.

In support of the proposition that the young child represents and epitomizes the far away savage stage of the race from which he sprang, we have the further fact that while the organic development and functional capacity of his heart, lungs, glandular organs and muscular and osseous systems have reached a high degree of perfection at birth, on the other hand his nervous system is in a very immature and undeveloped state.

The brain of the young child, as compared with that of the adult, contains a larger percentage of water, is softer, more easily irritated, and is much sooner fatigued on mental exertion; but, on the contrary, the perceptive faculties, whose development depends on the training of the special senses, are keen and alert and attain a high degree of perfection if given an oppor-

tunity in childhood to develop in accordance with the laws impressed by nature upon the race throughout the ages.

With these principles clearly in mind, let us see what application can be made of them by the physician in warding off physical and mental ills and helping the individual and the race to attain the highest physical, intellectual and moral perfection and happiness.

When we consider the phylogenetic history which the child represents at the time of its birth, the long aeons of time and the enormous evolutionary progress through which it has already passed, we can have some appreciation of the force and wisdom of a remark once made by Dr. Oliver Wendell Holmes, that *in* order to treat a child successfully you ought to begin two hundred years before it was born.

So strong are hereditary tendencies that, no matter how favorable the environment may be, they influence, either for weal or woe, the individual and his offspring for generations.

This brings us to the first fundamental proposition, viz.: that in order to reach the highest development and the most complete living, the individual should be well born; that is, both the parents at the time of procreation should be in good health and be free from all taint of tuberculosis, syphilis, carcinoma, or other hereditary or communicable diseases or constitutional predisposition to the same. Then, during pregnancy, the mother should obey the laws underlying good hygiene and correct living in the matters of proper clothing, diet, exercise and the avoidance of all stimulants and narcotics, as well as late hours and undue emotional excitements which have a peculiarly pernicious influence upon the rapidly developing foetus. One night of dissipation may cast a shadow over a thousand years of the phylogenetic history of the rapidly developing embryo!

After birth the infant should be nourished at the maternal font designed by nature for its sustenance; and if the mother has been properly raised and cared for during pregnancy, she will in almost every instance have an abundance of milk, and it will be a rare thing indeed to be obliged to feed the child on cows' milk or the many nostrum foods with which the market is flooded. Then, too, it should be zealously guarded against poisoning by stimulants and narcotics in any form. Opium and

alcohol in all their varied forms, with their siren and delusive promises, should be forever banished from the nursery, and the child at least be given an opportunity to select its own drug habits in later years without having them forced upon it at this early age.

Right here I want to make one suggestion. As you all very well know, water is the great solvent on which the system depends to convey nutritive material to every cell and tissue of the body as well as to remove their accumulated waste and broken down products. These cells and tissues are surrounded by dialyzing membranes, through which a constant endosmosis of nutrient material and an exosmosis of retrograde products are going on. An abundance of water is necessary at all ages to keep these membranes in good working order, but especially is this true in infancy and childhood, when the assimilative and eliminative functions are so active. Often young infants cry from so-called colic and are dosed with brandy, paregoric or some such abomination, when they are suffering from thirst and a few spoonfuls of cold water will relieve the difficulty and they will fall into a peaceful sleep. All young children should have plenty of pure water at regular intervals.

The clothing should be made so as to give free movement to the limbs and permit a natural and unrestrained development of all the organs and functions of the body. The young child should have at regular periods an abundance of plain, unstimulating food and plenty of exercise and spontaneous play in the fresh air, and should at an early age be trained to habits of regularity in attending to the functions of the body.

As childhood is the time of active development, and as sleep is nature's great upbuilder and restorer, children should have an abundance of sleep during all these years, and especially while attending school.

All stimulants and excitements, such as late hours, children's parties and the many artificialities of our so-called advanced civilization which tend to bring about a premature maturity, should be strictly avoided.

During childhood, when their perceptive powers, memory and imagination are active, they should be brought in close contact with Mother Nature, from whom they will gain far more

physical strength, mental power and wisdom than can be obtained from the formal methods and conventionalities of most of our schools.

And right here I desire to enter a protest against the long hours, continuous mental strain, cramming methods and forcing processes of most of our modern schools. Scarcely is the child out of the cradle before it is sent to a kindergarten school. Here, if it is so fortunate as to have a teacher who understands and is thoroughly imbued with the true spirit of Froebel's teaching, it passes a happy time and receives much benefit. Its books are plants, flowers, trees, fruits, birds, insects and the various objects, animate and inanimate, of the external world by which it is surrounded. The everlasting hills rising in majesty and grandeur, the soughing of the wind among the trees, the murmur of the brooks, the glorious sunsets, the autumn forest with all its gorgeous hues and kaleidoscopic changes—in short, the almost infinite variety of objects and the innumerable beauties of nature, can be made most impressive sermons by the true kindergarten teacher, sermons which will sink deep down into the soul of the child and leave an impress on its body, its mind and its character which the storms and vicissitudes of life will never obliterate. But alas! such teachers as we have in mind are like angels' visits—rare indeed, and come to us like a ray of hope from the great beyond. In the majority of instances even the life of the kindergarten is smothered by the blighting curse of formalism; instead of being a blessing it is made a curse, and, through ignorance or disregard of the most rudimentary physiologic laws, lays the foundation of physical defects or disease.

But if this is true of the kindergarten, what shall be said of the average primary school? In the words of Dante, there should be inscribed over the portal "He who enters here leaves hope behind;" because, from my observation and information about our schools, from the time the pupil enters the first primary grade until he completes the grammar school course, he is continually subjected to such a grind and cramming for examinations that he must indeed be made of stern stuff if he does not emerge from this course weakened in both body and mind.

The object of all true education should be a well rounded, symmetrical development of all the powers—physical, intellectual and moral—of the individual; but in the face of this truth, which is acknowledged by all educators worthy of the name, we see children from six to fifteen years of age, during a time of intense developmental activity, subjected to a course of study which in many instances is entirely beyond their comprehension and a source of constant irritation to their immature and unstable brains.

Especially to be deprecated is the everlasting number work and arithmetic drill which appears to have become a mania with the large part of the teachers in our schools to-day. From the time the unfortunate child enters the first primary, through the eight long years until he emerges from the grammar course, he is subjected to a continual grind in number work, problems and examinations. Morning, noon and night they are a veritable old man of the sea to them. Hanging like a pall over their hours of leisure and even invading their dreams, they have become not only a menace to the health and happiness of the children but also a nuisance to their parents, who can not enjoy a quiet half hour because a puzzled child can not solve a long list of problems far beyond its comprehension and appeals for help.

But after all this work, worry and grind, what results are attained? I believe I am justified in saying that they are nearly always entirely inadequate, and often a dismal failure; and that any eleven- or twelve-year-old pupil who had never looked into a written arithmetic, but who had been carefully drilled in mental arithmetic, could do more and better work and obtain a clearer comprehension and more thorough grasp of the subject in three or four years than the struggling child obtains by its eight years of arduous and detested toil.

Then, too, the systems of examinations in vogue in so many schools are a veritable *bete noir* to the pupils, who are kept in a constant state of worry and irritation and subjected to a continual nervous strain. The work, instead of being inspired and vitalized by a love for truth and a desire to penetrate and understand the secrets and laws of nature, becomes a mere mechanical cram and filling-up process to pass the examination. This sort of work, as every one knows, has not only little real edu-

cative value, but, by leading to makeshifts and subterfuges of various kinds as well as downright cheating, degrades the pupil.

Healthy mental and physical growth and activity are conditioned on an enjoyment or appreciation of the work being done. A distasteful task, or one done under compulsion, fatigues the mind much sooner, and leaves a much more evanescent impression, than one which arouses the pupil's enthusiasm and engrosses his whole attention.

When the teacher so directs the pupil as to call his physical and mental powers spontaneously into play, the dry rot of formalism and routine vanishes as if by magic from the school; and instead of the tired, disgusted look on so many young faces, produced by the mechanical leveling process which, by confining within restricted bounds, reduces all to the same plane of mediocrity, we see the flashing eye, the eager, intent purpose, and the whole soul of the pupil aroused by a noble enthusiasm. Who will say that in true educative value, one hour of such work is not worth weeks—nay, months—of spiritless cramming?

Nor are spontaneity and interest less important in physical than in mental work. Free, unrestrained, spontaneous play in the open air is of infinitely greater value in developing the body than any indoor formal exercises, although properly directed gymnastic exercises, if subordinated to outdoor sports, can be made valuable adjuncts.

So many pitfalls and dangers lie hidden in the pathway of the rapidly evolving child that in order to guide him wisely and safely through the intricate labyrinth, to avoid the Scylla of physical ills on the one side and the Charybdis of mental evils and abnormalities on the other, it is necessary that the physician should at least have a clear outline knowledge of his evolution, and know something of the physical and mental characteristics and potentialities impressed upon him throughout the ages.

WHAT THE PHYSICIANS AND PEOPLE OF COLORADO NEED MORE THAN A MEDICAL BILL.

BY P. D. ROTHWELL, M. D., DENVER.

For any legislation to be effective in a civilized country, it should be backed by an enlightened public opinion. Laws enacted in advance of public opinion are an encumbrance to the statute books. A law that is not enforced should be abrogated.

We have made several attempts to secure legislation in accordance with medical ethics. Do the people of Colorado understand what is meant by the term "medical ethics?" Does our esteemed governor know that "ethics is the science of right conduct and character; the science which treats of the nature and grounds of moral obligation and of the rules which ought to determine conduct in accordance with this obligation; the doctrine of man's duty in respect to himself and the rights of others?" The word medical, as used above, calls attention to a certain class of obligations and their requirements.

As physicians we know that our efforts were ethical, and that the welfare of the people of Colorado was foremost in our thoughts.

A bill framed in accordance with the doctrine just stated passed both houses of the legislature, but it was turned down by the one-man power vested in the governor—the vetoer using several thousand words to degrade the medical profession in the eyes of the people and insult every ethical physician. There was not one of us that was not seized with a strong desire to repel the low insinuations of the pettifogger. It would have been no trouble, for there was not a logical statement from first to last. Let us look at a few sentences as they appear in the Christian Science Sentinel, which contains nearly all of the veto message. [By the way, it says: "His veto message will, in our opinion, rank among the great state papers of the present decade." (!)]

Governor Thomas says: "The department of surgery excepted, medicine is not a science. It is a series of experiments more or less successful, and will become a science when the laws

of health and disease are fully ascertained and understood." Applying this standard, which is almost perfection, and we may well ask Is there a science? What of jurisprudence, astronomy, zoölogy, physiology, electrology, metallurgy, geology, theology, philology, etc., etc. The dictionary says these are sciences. Governor Thomas says they are not, for by his standard nothing can be a science except it has passed the experimental stage. Medicine has for its foundation the sciences of anatomy, physiology, histology, chemistry, botany, biology, pathology, electrology, anthropology, psychology, metaphysics, climatology, meteorology, ethics, common sense, etc., etc. As an art, medicine applies the principles of these sciences as needed in the cure of diseases. Arithmetic is both a science and an art. As a science it investigates the principles of numbers; as an art it applies these principles to business transactions. Is the art by any means perfect? Are not calculators prone to make mistakes? No one is foolish enough to rail at arithmetic because errors occur in calculation. Telegraphy is an art. Back of it is the science of electrology. Are you sure when a message is sent that it will reach its destination on time? Might not a great many things occur to upset the telegrapher's calculation? We are as certain to deliver a child safe and sound into the world as the Western Union is to deliver a message in New York. The telephone is not free from blunders. Are these to be put on the back shelf because everything in connection with them is not understood or does not give perfect satisfaction?

Physicians are modest in their claims because from their comprehensive view they know many things interfere with the finest theories of treatment. They come as near perfection in their work as the lawyer, the minister, the navigator, the railroader, or the telegrapher. Lawyers do not win all their cases. Ministers do not cure quite all the souls that come under their care.

You will notice that the idea is conveyed that surgery is a science; and yet every one knows what a wonderful field for experiment it is, and how the surgery of to-day differs from that of even ten years ago.

Again the governor says: "The fundamental vice of the bill is that it denies absolutely to the individual the right to

select his own physician." The bill did no such thing. It had nothing to say about whom the people should select. It asked that those that made claim to the title of doctor should have the attainments the name implies. There is a law for attorneys, dentists, druggists, plumbers, horseshoers, etc., and why should not the people have one in our case?

Confronted with this veto message what method of redress had we? Was there a vehicle by which we could reach the people? Outside of what we could do by individual effort, we had no means whatever. The secular press is now, and always has been, against us. The religious press is in the hire of our enemies. The medical press circulates amongst ourselves and, though often containing articles really intended for the people, yet they never reach them.

Our enemies reach the people through the secular press, the religious press, a portion of the scientific press, almanacs, bill boards, posters, dodgers, street-cars, pamphlets, drug stores, hired emissaries, hired testimonials, street fakirs, and we blush to say that our mountain peaks and the walls of our cañons are plastered over with disgusting falsehoods. A large portion of our secular press takes a delight in disparaging our work, impugning our motive and discrediting us in the eyes of the people. If, in a public address, anything is said in commendation of our work, it is left out of the newspaper report. If a speaker relates anything respecting the early superstitions connected with the study of medicine—anything that could be construed to our injury—that they take great pains to publish. Satan does not rejoice more when some worthy man stumbles than does the business manager of one of the so-called great daily newspapers when he finds some weak-kneed physician joining the advertising throng. The two then and there form a compact to defraud the public and stand by each other. Have you noticed how carefully the press reports the failures in operations for appendicitis? Are they careful to publish all the facts? Are they not delighted to spread abroad the tidings of the cruelty of vivisection, no matter how humanely conducted or for what scientific purpose? In the same issue they may worse than vivisect a human being that incurs their displeasure. Does the press take care to publish facts? Not always. Often the lying sensation is

preferred to the living truth. Is the press really concerned in furnishing the news? What is news? The Century Dictionary thus defines the term:

(1) "A new or uncommon and more or less surprising thing; a new or unexpected event or occurrence."

(2) "Recent, but not necessarily unexpected, intelligence of something that has lately taken place or of something before unknown or imperfectly known."

Please note the definition and then think for a moment what is spread before us as news. Did you ever know a newspaper to furnish correct "intelligence of something that has lately taken place?" If an event is "imperfectly known," is it not distorted and unknowable when the press takes it in hand? Look at the accumulation of nastiness known as the Sunday edition—from the censored telegraphic reports to page after page of blatant quack advertisements—and any candid person must admit that one-half of the mess is false.

The non-advertising member of our profession is at the mercy of the press. We have no redress. An article written by one of us exposing the evils so unblushingly flaunted before the people would not be published. It would be against business interests and hence, don't you see, would interfere with a fancy styled "The Liberty of the Press!" The people have asked you Why do you not write and expose these charlatans living off the credulity of the public? Some begin to think the oft repeated lies must be true, and that we are guilty as charged. They do not know that the whole newspaper trust is against us and that there is no such thing as liberty of the press. They license themselves, and money is what dictates the quality and quantity of the news.

How long will the ethical members of our noble profession submit to the tyranny of this monster, vulnerable at every part of his flimsy armor? Let us gird ourselves with the whole armor of truth and go forth as David of old and meet this bloated, pampered, boasting Philistine that would defy the army of living truth. We could not immediately slay and cut off the head of this giant, but we could so implant the germs of truth amongst the people that even in our day we could do some useful fumigation, with the hope that our children would conduct the autopsy

and our grandchildren officiate at the crematory, remembering that patience is man's nearest approach to nature's processes of creation and renovation.

How are we to begin this duel? In my opinion a journal should be published under the auspices of the Colorado State Medical Society for circulation amongst the people. It should be ethical in its every word and expose the folly of superstition in all its forms, from the horse chestnut for rheumatism, the horseshoe for good luck, the ill luck of Friday and the number thirteen, etc., to the demented vaporings of a Mrs. Mary Baker Eddy, who would have us believe that everything is God, even to the poison lurking in the adder's sting.

Our journal should expose the testimonial fraud so that people might know that testimonials are for sale—sometimes for money, sometimes for notoriety. There are men and women making a living by writing testimonials. Such frauds should be hunted down and their motives exposed. They are more dangerous to the welfare of society than either the forger of checks or the cur with rabies.

The retired minister that we know has ceased to commune with his God and worships mammon in the form of a "sovereign remedy"—the wolf in sheep's clothing, prostituting the name of his office to cheat the people, should be followed, his remedy and his mode of life analyzed, so that the people may know the truth.

The advertising doctor. The people as a rule despise those amongst their number that are given to the vice of bragging, boasting and loud talking—the silly "know it alls." The quack in all his various garbs is an individual that blows his own horn and hires the press to intensify the vibrations—the people pay the bill. Do lawyers try to reach their clients in any expensive style like this? What would you think of a minister that would advertise his methods of curing souls as the best, and that he had a patent on it? How would the judges treat a lawyer that thus degraded his calling? As medical men, accustomed to searching for and loving the truth, we admire the editor of a decent journal, and we know the immense power for good he controls; we respect the broad minded lawyer defending the truth for truth's sake; we revere the minister guarding the spiritual welfare of his flock; we abhor the editor that prostitutes

his paper to vile uses; we detest the lawyer that stoops to the cunning and tricks of the pettifogger; we loathe the minister that lends his name and influence, and perhaps his photograph, to bolster up a miserable nostrum. A few examples to make my meaning more plain may not be out of place. A certain Denver minister had a brother dying of consumption in the East. He had him come to Denver and drink of the waters of life as they flowed through the Ed Chase-Gun Wah faucet. A testimonial appeared in the daily papers setting forth the wonderful improvement in the case. The brother went on to California and came back a corpse, and in the paper containing an account of the death was this same testimonial signed by this supposed follower of Him who died for the truth. Did you see this? I saw it. Would you be willing to denounce such an abettor of quacks and gamblers and hold him up to the scorn of an outraged people? I am ready and willing and have longed for an opportunity to show up such hirelings. Is that minister alive yet? Yes, right here in our midst, preaching the gospel!

Not long ago a church paper came to my home. On the first page was a picture of the scene on Calvary—the crucified Redeemer. A few pages on was the announcement of a notorious quack offering one hundred dollars for any case of catarrh he could not cure. Do you think my spiritual growth was much improved by this juxtaposition of infinite love and sordid greed?

A few days ago an aged woman was suffering most intensely. For a long time she had been a most liberal patronizer of "sovereign remedies." Gallons of these money makers had been swallowed. None of them were of any avail in the present crisis. It was my turn now. It was a good place to do a little thinking, so this question was asked: "Did you ever think that if you were really sick, as you are now, not one of the advertisers could reach you, and that although you have supported them liberally for many years, they know nothing about you and care less—(algebraically speaking)?" She thought a minute and said: "Doctor, I never thought of that. I have taken my last dose of patent medicine." She has kept her word. Conversion was late in the day, but better late than never. With a proper vehicle to present the light as revealed to us, no one knows how many could be reclaimed from the pernicious habit

of taking medicine without proper instruction. Hundreds of instances could be cited where the people should know the facts. We represent the most progressive science of the day and the one that is doing more genuine good for the race than several of the others combined. We are surely an earnest profession and have the courage of our convictions. Should we be afraid to take the people into our confidence and guard them against the wily tricks of the designing charlatan? Do not think for a minute that there would be any attempt made to teach every individual to be his own doctor. That would be impossible. Free the profession from the miserable barnacles that now hinder our progress, and the good we are doing could be vastly increased. We can do this by teaching the people medical ethics.

There are twelve hundred physicians in Colorado. It is safe to say that eight hundred of these are family physicians. The family physician is all right to the families he attends. Some other person's family physician is all wrong—in fact he may think very hard things about him—but his is one of the best men in the world. Supposing each family physician could circulate twenty copies, and that is a low estimate, we could begin our work with sixteen thousand families—one hundred thousand readers!

Do you believe with such a power going quietly and decently into the homes of our beloved state, breathing a spirit of purity and truth, that Governor Thomas would have dared to put Centennial Colorado in the rear rank and made it the dumping ground for the quacks of three continents and the preferred home of the mountebank?

Do we not live close enough to the hearts of the people to point out the dangers of our present school system? This system, in defiance of natural laws, aims to take the Johnnies and Tommies, the Jennies and Maggies of our city and state, and after running them through a graded course, giving them a nibble here and a bite there, a taste of this and a peep at that, destroying their individuality, stultefying their intellects, dwarfing their stature and often ruining their health, unfitting them for the duties of life, making them unsatisfied with their surroundings, it turns them out as educated. We know this is not education. We know that such unnatural training is destruc-

tive to the best interests of the commonwealth. Nails, tacks, screws, pins and needles can be made by machinery, politicians by the machine, but men and women can never be turned out that way. The system of education is on a par with the quack's system of medication—a "sovereign remedy" to cure all diseases in all sorts and conditions of men without regard to sex, race or previous condition of servitude.

We have seen that we are opposed by almost a united press. Let us unite and in a dignified manner, becoming to a body of ethical gentlemen, begin a struggle against the vices that are degrading the people. There is an element of conscience and right feeling in the community which now and again asserts itself with overwhelming power in American affairs and saves the nation. We have a public conscience, even if a large part of the time it is in an anæmic condition. It needs the red blood of righteous indignation, not to be exhausted in spasmodic warfare against occasional crying or killing evils of false medication, but against the whole rotten system of quack advertising, false testimonials and superstition in all its forms. Public opinion so enlightened and strengthened would demand the reforms we have asked in the interests of the people. Let us unite and in the name of Hippocrates, Galen, Paré, Virchow, Jenner, Sims, Lister and thousands of other heroes, living and dead, teach amongst other things that Ian MacLaren's Dr. William MacClure of the Bonnie Brier Bush is the rule and not the exception in the great profession to which we have dedicated "our lives, our fortunes and our sacred honor."

DISCUSSION.

Dr. E. Stuver—I believe that the thanks of this society are due to Dr. Rothwell for his most excellent paper. There is no question about the fact that what the medical profession needs more than anything else is an *esprit du corps* that will bind them all together in a closer organization. If every member of the profession in the United States belonged not only to a county and state, but also to his national medical organization, the medical profession of this country would not present so pitiable an aspect in many cases as it does at the present time.

Now, as to the relation that the physician holds towards the newspapers, he has most graphically set forth the facts in the case. I have had a little personal experience in the matter myself. About two years ago I suppose that some of you will remember that a most virulent and malignant attack was made by the secretary of the so-called Humane Society against the medical profession of Colorado in particular and the whole medical profession of the world in general. I took it upon myself to write a reply to this attack, or, rather, two attacks, as presented in one of the leading dailies of this city, sent the paper to the editor, and, after a great deal of haggling and quibbling about the matter, it was returned to me and I was asked to cut it down one-half. As a matter of course the paper cut down one-half would have been emasculated so that it would not have amounted to anything. I sent it to another daily paper and it was returned without any comment whatever. The physicians' side of the question is not recognized at all if it is not something sensational and something that will appeal to the passions of the masses.

Dr. R. F. LeMond—I was delighted to hear that paper of Dr. Rothwell's, and I am glad that we have men in our profession who have nerve enough to attack anything. Now this paper is a good one, and it comes forward on all of its feet. I tell you if we will all stand together as a united body and attack this quackery that is everywhere about us we would down some of it, and that is what we will have to do. I would be delighted if I could subscribe five thousand dollars to be put into a journal to expose this quackery. I know of different things that we have been attempting to expose and knock out and they have downed us every time. I had two quacks call on me a short time ago and want me to give a lecture and some points on the eye. I said, "The idea of giving you a lecture on the eye for fifteen or twenty minutes, when we require four years here to go through a medical college and graduate, and then you go out here practicing." I said, "No, sir, I won't do it." They had a child along with them and I charged them five dollars for the examination. They finally turned the child over to me and I got fifty dollars for treating it. If we had a governor who would do as he should

have done we would now be pretty well rid of this quack element that is making itself so conspicuous in this city and state, and our noble profession would have been elevated to its proper position. It makes me sick and tired when I pick up these Sunday papers and see the enormous amount of quackery advertising. They are a disgrace to our state, and I just wish we would come together in a body and subscribe to a journal that will help to place us right with the people and to expose this disgusting element. I believe if we will bestir ourselves we can do something in this line of work. I fully agree with the doctor in the position he takes, and I think we ought to vote Dr. Rothwell a vote of thanks for this strong paper which is a credit to this honorable body.

Dr. J. Hawes—I would like to stand here and comment as heartily as all the others who have spoken on the excellence of the paper which has just been read to us. I want, however, to place before you one of my views in the matter. I recognize the fact that the majority of people look upon us as being deeply, personally, selfishly interested in this matter, whether it be true or not. Accepting, then, that view by the people, I can meet them upon their own ground. A man came to me a few days ago and said, "What do you think? Had I better vaccinate my children?" We happened to have some smallpox in the vicinity. I replied, "I don't give a —— whether you vaccinate your children or not. They are not my children. I have been doing your practice for twenty-five years, and if you leave them unvaccinated and they get smallpox, I will get a good deal more out of you for treating them for smallpox than I will by vaccinating them. You seem to think I have a personal interest in it. I have not one-tenth part of the personal interest that you have." If a person comes to me with a broken limb and says, "Doctor, do you want to set this leg?" I would say, "No, I don't care whether the leg is set or not. It is your leg. If you can stand it I can." Let the people feel that they have fully as much at stake in these matters as we have, and they'll take an interest in themselves sometimes.

Dr. J. W. Hawk—I think the better way to get at this matter is before elections in the fall—to be sure that you get the right men nominated to make your laws.

Now, I am from Wyoming, and we got a law through last winter. I had the misfortune to go to Cheyenne, and we framed a law and got it through. Before we brought this bill up I went around to see all the members of the house and also of the senate, and I am glad to say we did not have a vote against it either in the house or senate. The only way I see to get anything through is to be careful that you get right men nominated for the positions and go to them and tell them what you want; that is about the only way I see to get anything through.

Dr. F. Finney—I do not take as pessimistic a view of this matter as the writer of the paper, although I agree with him in many of his statements. It seems to me that the outlook is encouraging from the fact that the medical bill was passed without very great difficulty by the recent legislature. It simply got knocked out by the one-man power. I think we are unfortunate in having a governor who has not ———

(Voice)—That is enough. (Laughter.)

Dr. Minnie C. T. Love—I would like to say that we have ordinances that would close the columns of the daily papers to a great many of the horrible advertisements that we see and that our children see every day if we could have those ordinances enforced. I think the Woman's Club and the W. C. T. U. women are trying now to have those ordinances enforced, and I think we should each help them all we can to see that some of the advertisements, at least, are cut out of our daily papers.

Dr. W. P. Munn—I am interested in what Dr. Love has said because the city of Denver now has on its books an ordinance which declares that the majority of the advertisements which she has mentioned, specifying the character of them, are indecent and that they shall not be allowed. A little over a year ago the mayor of this city, finding such an indecent advertisement under his own door, without consulting anybody else inaugurated a prosecution on his own account before the police magistrate (the same person is now the city attorney of the city of Denver), who decided that it was not within the power of the city council to pass such an ordinance, and that therefore the ordinance as it stands is invalid. The same provisions are embodied in a statute of Colorado. It is on the statute books now.

It is absolutely impossible to get the district attorney to take it up. I have tried to get the district attorney to take these matters up, and have furnished him the information enabling him to do so. This has been done especially in reference to those advertisements which are undoubtedly inserted with a view of attracting correspondence from those who desire to have criminal abortions performed. We could not get the district attorney to take up the prosecution. The state board of health then, through Dr. Sewall, inaugurated a movement through the United States courts in the endeavor to have the newspapers that published these indecent advertisements excluded from the mails. There is no doubt that the law as it stands was intended to exclude those things from the United States mail. But the United States district attorney has also put us off with fair words and will not take up the prosecution. *He will not take up the prosecution.* Only last week I noticed in the paper that a half dozen of the cases that had been brought at the instigation of one or another person interested in this matter were dropped, because the papers were found to be defective in this or that particular; that was misleading; in one instance an error in the initial of a person was seized hold of by Judge Hallett as an excuse to throw out an indictment. The medical profession might as well recognize now as at any other time that the legal profession, whether it is on the bench or off the bench, will not allow the enforcement of those laws. The legal profession is committed to the support of indecency and to the prostitution of the public press; and the legal profession and the newspaper profession play no better part than these other low characters that are go-betweens between those who prostitute themselves and those who desire to patronize them.

Dr. J. M. Blaine—After listening to the remarks of Dr. Munn, I am more than ever convinced that the stand taken by Dr. Rothwell is the correct one to pursue. I had a little experience this winter which illustrates both sides of the case. About two months ago a certain clergyman in Denver preached a sermon on the purity of the Denver press. Of course the reports that reached the people were written by the reporters, and they used such parts of the sermon as best suited their ends. The next morning, after reading the good reverend brother's sermon,

I picked up a pair of scissors and cut out twenty-one advertisements from the same paper in which his sermon appeared—and, by a strange coincidence, after turning his sermon over when I had cut it out, there was a picture of that notorious Sixteenth street belt on the back of it, advertising its great efficacy in curing lost manhood, etc. I cut these twenty-one advertisements out and mailed them to the good brother, and told him he had evidently overlooked a few of the things in the Denver press when he called it pure. He courteously replied that he confessed he had never seen those things that I had sent to him. And I think there is a fact worthy of note, that the average layman or laywoman does not see all of these things, but those who do see them certainly would feel that it was an objectionable kind of literature. That illustrates what Dr. Rothwell has said, that we want to educate the people.

Now, to illustrate what Dr. Munn has said: I thought I would pursue the subject a little further, so I cut out twenty advertisements one day and mailed them to the first assistant postmaster general, who attends to those things, and I got a letter from him saying that *if* the law had been violated in publishing such things, the United States district attorney would look after the matter. That was not what I wanted him to say. I wanted him to say whether the law had or had not been violated in publishing these things. He simply dodged the question by saying "if it had." So I mailed him the paper—it was an up-to-date paper, too—in which these appeared, and wrote him another letter, and told him I wanted his decision on the character of these advertisements. He has not written yet. But if he does and says they are immoral, as we know they are, then I will confront Mr. Greeley Whitford with that letter. I want to go before him with a letter from headquarters, so that he will feel more like acting. But, as Dr. Munn has said, it is not of much use.

Dr. P. D. Rothwell—You that discussed my paper did not bring out the particular points that I wished brought out. Of course you discussed it from your standpoint, but you did not state whether it would be advisable to have a paper, a journal, that would represent the best sentiment of the profession in Colorado under the auspices of the Colorado State Medical Society.

Some of us can probably meet our patients like Dr. Hawes and say, "We don't care a d——, it is your own business," and so on, and that is a very nice and very easy way out of it; but I can not get out that way. These things create in me a desire to rebel. When insinuations are cast upon the profession to which I belong I feel like rebelling, and I would like some means by which I could reach the people in a satisfactory and decent manner. Many of the people think that all physicians who go to the county hospital are paid large fees for their services. There is a vast amount of ignorance throughout the country in respect to the work that we are doing; it is remarkable, and for that reason there ought to be a vehicle to reach the people and tell them these facts in a plain way so that they could understand it. I think if we could take an analysis of, for instance, Warner's Safe Cure, put the analysis into a journal that will go amongst the people, and show the people how they can make it themselves and make it by the barrel for about a dollar a barrel, show them how they could make it at home and make as good a preparation for about a dollar a barrel, the effect would be very beneficial; for if there is any way to reach the American people it is through their pocketbooks. There are many ways—I could not say all the ways—in which a journal could be used to do good, and I do believe that such a journal should represent us as we are. The ministers have a journal (I read an extract from it) that goes amongst the people and expresses their side of the question. We live just as near the heart of the people as ministers—I think a little nearer—and I think we are doing more good than several of the other professions combined, and we are doing it in the interest of humanity. I believe we have a right to take the people into our confidence and show them the manner in which they are imposed upon. Light has come down to us through the generations. Is it proper that we should put under a bushel the very things that are essential to the vitality of the commonwealth? Of course we may be indifferent about it, and say it is the people's own business and if they want to dose themselves let them, but that is not the attitude of the medical profession. If it were there would not be the experimentation going on that there is; we would not be the progressive scientists that we are if that were the attitude of the great mass of the medical profession.

BONE NECROSIS FOLLOWING TYPHOID FEVER.

BY F. FINNEY, M. D., LA JUNTA.

Since November, 1896, I have seen, comparatively speaking, an unusual number of cases of bone inflammation resulting in necrosis following typhoid fever. The unusual number of these cases, and their persistence, has caused me to investigate the subject somewhat, although not as thoroughly as I could wish. I do not find much in the medical literature at my command bearing upon the subject. Thatcher, in his article on the etiology and general pathology of typhoid fever in the recently published Twentieth Century Practice, refers to the bones as being "peculiarly liable to suffer from the action of the typhoid bacilli. The latter have been found by many observers in the medullary tissues of the bones and in the inflammatory products of their lesions."

The lesions are most commonly periostitis with resulting necrosis or abscess, and have been classified by Keen as follows:

Necrosis, 85 cases; caries, 13 cases; periostitis, 110 cases; ostitis, 12 cases; osteomyelitis, 10 cases; exostosis, 1 case; granuloma, 2 cases; uncertain, 4 cases.

Except in rare instances the bone lesions accompanying or following typhoid fever occur during the latter part of the disease, or after convalescence has been fully established. In my own experience the latter has been the case, all of my cases having occurred in from two to six months after convalescence had been fully established. Keen's table of 186 cases shows as to onset, 16 in first two weeks, 66 in third to sixth week, and 104 from months to years after fever, thus bearing out the assertion already made, a large percentage of them occurring during convalescence or after it has been fully established. The extent of bone disease varies from a small, superficial area to the death of a whole bone. Another author, in the Twentieth Century Practice (Brannon on Symptomatology and Treatment of Typhoid) states that over two-thirds of the cases occur in persons over 20 years old. The tibia is mentioned as

being the bone most frequently attacked, next in order coming the ribs and costal cartilages, femur, ulna, humerus, the vertebræ and superior maxilla.

There seems to be no doubt but that the bone lesions are due to the presence of specific bacterial infection, even when the trouble does not occur until weeks or months after the attack of typhoid.

One author states that "in fifty-one cases in which a bacteriological examination was made, the pyogenic bacteria were found in thirteen, and in the remaining thirty-eight the typhoid bacillus was found, often in pure culture."

I regret to say that in the cases which I will now briefly report no bacteriological examinations were made. The cases, however, were all well marked typhoid fever of about the usual duration under the eliminative and antiseptic treatment. In my cases the bone lesions followed, but in no case occurred during, the typhoid attack.

Case 1, A. F., male, age 35, in November, 1896. Came to my office about three weeks after complete recovery from an attack of typhoid fever, which had lasted from October 16 to 28. Complained of a sore spot over the sixth rib, left side, about two and a half inches to left of sternum. I examined and found tenderness and slight swelling. Counter-irritating with iodine was resorted to for two weeks without benefit. Then hot gauze applications for another week. The swelling increased, but very slowly, and I finally decided to open down to the rib. This was done, and a considerable amount of pus let out. The sinus continued to discharge pus for three or four weeks until the opening was enlarged and the necrosed bone scooped out with the Volkman spoon, when the wound quickly and permanently healed.

Case 2, B., male, age about 36. Patient of Dr. Kearby, of Rocky Ford. The attack of fever was in the fall of 1897, and the bone disease did not occur until the winter of 1898. Dr. Kearby brought him to me for operation, having recognized the condition. The disease was on the shaft of the sixth rib, about two and a half inches to left of sternum. Under anæsthetic the rib was cut down upon, and all diseased bone scooped out with Volkmann spoon. The wound did not entirely heal, and,

after waiting about two months, a second operation was done under anæsthetic. This time the operation was a success, and the wound healed quickly and perfectly.

Case 3, C. J., male, age 16. Had typhoid in October, 1897, and developed a peritonitis of tibia of left leg in January, 1898. This case developed nothing of special interest except the persistence of the disease, requiring two or three operations to get rid of all necrosed bone, and he finally made a perfect recovery.

Case 4, D. D. R., male, age 55. Had typhoid in October, 1897. Began to have a sore spot over sixth rib, at junction of rib and costal cartilage, about three months after the attack of fever. He called my attention to it, and was put on treatment with a view to allay the inflammation. The disease of the bone and costal cartilage slowly progressed, and an abscess formed and was opened, drained, and washed out with antiseptic solutions, with a hope that it would heal without a more radical operation which was greatly dreaded by the patient. The suppuration did not abate, and at last, in November, 1898, after almost a year of suppuration, an operation for the removal of the necrosed bone was done. The operation proved only partially successful, a small sinus remaining, showing dead bone at the bottom. Time was again given for nature to repair, but to no purpose, and the patient was again operated on in May of this year.

The above briefly reported cases occurred in private practice, and are all in which bone complications manifested themselves out of forty cases of typhoid treated.

In conclusion, I note that three out of the four cases involved the sixth rib on the left side, at almost exactly the same spot, and that none of the cases recovered without operation. The general health did not seem to be greatly impaired by the long continued suppuration that occurred in some of the cases, but the disease showed no tendency to recover without operative procedure.

There was no history of injury as a cause in any of my cases.

DISCUSSION.

Dr. Leonard Freeman—Post-typhoid bone lesions are of such importance that the subject should not be passed without discussion. It is supposed by some that typhoid bacilli are distributed all over the body, in bones as well as elsewhere; and for some reason, whether from local injury or from a spot of least resistance, they develop and cause bone trouble. In some cases, however, they may produce general irritation of the bones, with rheumatic pains. Roswell Park makes a somewhat peculiar remark in one of his papers. He calls attention to the rapid growth of individuals following typhoid fever; that they sometimes grow as much as a millimeter in a day. He believes this growth is due to irritation of the bones by the typhoid bacilli. One can hardly believe this. It would seem that the bones would grow more in one portion of the body than in another. The distribution of typhoid bacilli could hardly be so general over the body that a uniform growth of the individual would occur.

Dr. Finney has called attention to the extreme difficulty in eradicating these bone affections. I have had some experience in this myself. They must often be operated on like a cancer or a sarcoma. He has indicated the extreme difficulty with which portions of a rib can be sufficiently removed to stop the disease. I call to mind the case of a physician who had a "typhoid rib" which required several operations. It took over two years of time, if I am not mistaken, for him to get rid of the trouble.

It is well to bear these things in mind, because the surgeon may be blamed for not doing his work properly when in reality it is practically impossible to get all the bone or cartilage out at one operation, owing to the thinness of the tissues beneath.

I reported some two or three years ago, in this society, a case which is worth re-mentioning. There was a periostitis of the ulna, coming on some six or eight weeks after the typhoid fever had subsided. An entire year after the trouble had appeared I removed a certain amount of purulent material from the swollen place over the ulna, and succeeded in developing from it a pure culture of typhoid bacilli. Typhoid bone lesions have been noticed two, three, four, six and even seven years after

an attack of the disease. Sometimes a patient will get entirely well and remain well for a year or two, and then the symptoms will recur and perhaps an abscess form.

Dr. J. N. Hall—There is one feature in regard to periostitis following typhoid that I want to mention particularly because in one particular case it gave rise to error in diagnosis, which I admit one might easily fall into. A soldier, on coming home from Cuba, having had there typhoid fever, had periostitis in the locality which seems to be a favorite place for it—which Dr. Finney has called attention to, viz., the sixth rib on the left side, and for which I can imagine no possible explanation—but in this case it had already burst and pus was running out quite freely. The patient was sent to me with a diagnosis of empyema, and that diagnosis had been made by a very competent physician; and yet there was a total absence of those signs which we usually find with empyema — no displacement whatever of heart or lung and no considerable area of dullness. In fact, the whole area involved did not cover a space larger perhaps than two silver dollars placed side by side, and yet, seeing pus coming out from the chest wall in that particular place, the physician jumped at the diagnosis of empyema. I mention this merely to call attention to that possibility of error, which can always be done away with by a careful physical examination.

THE PREVENTION OF CERTAIN COMMUNICABLE DISEASES IN COLORADO.

BY G. E. TYLER, M. D., DENVER.

The successful work of health authorities must ever rest upon sound professional support and substantial lay public opinion. The health officer can not adequately cope with the problems of his office without the cordial, active support of the medical profession, no matter how great his legal powers. Upon no class is he so dependent as upon physicians; to no class does he owe so much. It is with the hope that the cordial relations already existing between the reputable physicians of Colorado and

the state board of health may be still further stimulated that this paper is presented to the most representative body of the profession within the state.

It is not my intention to deal with all communicable diseases or with all methods of prevention, but to dwell upon those which, by reason of existing conditions, demand special attention. Smallpox, tuberculosis, diphtheria, scarlet fever, typhoid fever, measles, whooping cough and rabies all demand the earnest attention of the health officers of Colorado. It would be both interesting and profitable to consider all these, but by reason of the time limit I am forced to confine my discussion to the two of greatest importance, viz., smallpox and tuberculosis.

SMALLPOX.

The past fourteen months have witnessed the introduction into our state of a disease from which we have suffered little for several years. Not since 1890 has the health officer of Colorado had to know or care much about smallpox. But since April, 1898, when the first case appeared within the state, there has been a continual battle with the disease. Sixteen separate counties have been invaded, with from one to eighty cases in each place, and the disease is still with us. What are the causes? Why has Colorado suffered?

1. The disease is widespread. The reports of the marine hospital service, which are of course incomplete, show that thirty-eight states and territories have been afflicted with the disease since last September, and this does not include the newly acquired dependencies, in all of which it has raged with more or less severity. Colorado's first outbreak had its origin in New Mexico, from which source she has since had at least seven other importations. She is also known to have suffered in the same way at the hands of Old Mexico, the Philippine Islands, Texas, Kansas, Missouri, Nebraska, Utah and Massachusetts.

2. Her population, by reason of neglect of vaccination, have proven a good field for its spread. The data are not at hand for a determination of the percentage of unvaccinated in her population. But the personal experience of reporting health officers, and the testimony of numerous other medical men throughout

the state, gives sufficient ground for asserting that this factor has been of great importance in allowing the spread of the disease. Because of the fact that a considerable minority of the laity fail to appreciate the almost absolute protection against smallpox given by vaccination, the following extract from a lecture delivered by Dr. Bizzozoziro, at Rome, is worthy of insertion and wide circulation.

He said: Germany stands alone in fulfilling in a great "measure the demands of hygiene, having in consequence of the "calamitous smallpox epidemic of 1870-71 enacted the law of "1874, which makes vaccination obligatory in the first year of "life, and revaccination obligatory at the tenth year. What was "the result? With a population of 50,000,000, having in 1871 "lost 143,000 lives by smallpox, she found by her law of 1874 the "mortality diminished so rapidly that to-day the disease num-"bers only 116 victims a year. These cases, moreover, occur al-"most exclusively in towns on her frontier. If it were true that "a good vaccination does not protect from smallpox, we ought to "find in smallpox epidemics that the disease diffuses itself in the "well vaccinated no less than in non-vaccinated countries. But "it is not so. In 1870-71, during the Franco-German war, the two "peoples interpenetrated each other, the German having its civil "population vaccinated optionally, but its army completely vac-"cinated, while the French (population and army alike) were vac-"cinated perfunctorily. Both were attacked by smallpox. The "French army numbered 23,000 deaths by it, while the German "army had only 278, and in the same tent, breathing the same "air, the French wounded were heavily visited by the disease, "while the German wounded, having been vaccinated, had not a "single case."[1]

3. Failure to recognize the disease in its early stages. In the separate outbreaks the disease has been mistaken for chicken pox, syphilis and measles. The observation of the marine hospital bureau,[2] which coincides with the experience of physicians in Colorado, has been that in the majority of mistaken diagnoses the disease has been called chicken pox.

4. Failure to report every suspicious case to those legally responsible for its control. In the outbreak which was most difficult to control, the local health authorities were not even given

an intimation of the presence of the disease for twenty-two days after its first appearance, at least 150 persons having been exposed meanwhile. It is difficult to understand why any physician should hesitate to report a case for investigation. Should it prove not to be smallpox, no inconvenience at all would be experienced in most instances, and none of consequence in any. But even allowing that there would be entailed a considerable inconvenience, it would be for but a few days at most, and the attending physician would in the long run gain rather than lose by reason of his precautions, for he would be seen to have the interests of the public at heart. While, should it prove to be actual smallpox, the failure to report it, and to provide against its spread by compelling the persons legally responsible for its control to at least share the responsibility, would unavoidably disgrace the physician in attendance. At least one marked instance of this has occurred in Colorado recently, the physician being forced to give up his practice and leave for another field, and this in spite of the efforts of the health officers to allay criticism.

5. Failure of health officers to rise to the situation. It can not be gainsaid that it sometimes occurs, though fortunately not often, that the health officer fails to provide adequately against the spread of the disease after it has been reported to him. Such failure may probably be ascribed to one of the following causes:

(a) The influence of environment. County and town officials are often reluctant to spend the money necessary to quickly stamp out a threatened outbreak. They imagine it will be cheaper to let things drift. The health officer stifles his conscience and goes against all his knowledge if he allows such a course to be pursued. He knows, of course, or he has no right to assume to be a health officer, that the poorest economy for the community itself, even allowing that he has not patriotism enough to protect the rest of the state, or courage enough to perform his plain duty under the law, is to allow an outbreak to spread; while the best economy is always to stamp it out without delay.

(b) Lack of executive ability. The lack of this absolutely essential quality is nowhere more apparent, and nowhere more disastrous in its effects, than in a health officer. He should have

ability to decide quickly, and to execute without delay. No time should be lost in taking the necessary steps. He who hesitates fails, and fails forever.

(c) Lack of knowledge of his legal power. More than once has the state board been asked whether the health officer has power to do what is necessary. Every one should know that the health officer, local or state, is practically an autocrat. And though suggestions of desirable additions to our present law are not hard to make, no officer should hesitate for a moment on this point. He has large power.

What does the future foretell as to smallpox? Are we to expect more outbreaks? What are the facts? The disease exists now, or has recently existed, in Wyoming and Montana on the north, New Mexico on the south, Kansas and Nebraska on the east, and Utah on the west. It exists in the majority of the other states and territories of the Union. It prevails to a great extent in the Philippines, whence our gallant soldier boys will soon return, and from which place letters are constantly being received. It prevails also in Cuba, and severely in Porto Rico, communication with both places being freer than for years. Undoubtedly Colorado must expect further importations. Unless all signs fail, she is liable to have more serious outbreaks next winter than she has experienced so far. She need not have, however, if physicians, health authorities and the public do all in their power to prevent it.

Health boards all over the state should take the following measures this summer and fall:

1. They should urge all citizens of all ages and conditions to be vaccinated and revaccinated until a positive result is obtained or until the operation has been performed several times with good virus. Free vaccination and revaccination should be offered to all who are unable to pay for it. Parents should be urged to have all infants vaccinated during the first year of life, and children should be revaccinated at five years.

2. School boards should be induced to secure the vaccination of all pupils. This can easily be done by requiring a certificate of recent vaccination before allowing a pupil to enter school. This authority rests with school boards and they should be induced to exercise it.

3. Contractors operating within the jurisdiction of the local boards should be induced to secure the vaccination of all employés. This can easily be done by an order requiring vaccination as necessary to retain employment.

4. Outbreaks should be anticipated by providing places to be used as quarantine and detention hospitals.

5. Failure to report cases of smallpox should result in vigorous prosecution of the offender, unless there be found greatly mitigating circumstances.

6. Disinfection should be most thorough.

New Jersey requires the report of all cases of chicken pox, and she has had unusual freedom from smallpox. If a similar regulation had been enforced here, several outbreaks of smallpox would probably have been prevented. I do not believe the conditions warrant such a plan at present, though if it were enforced it would greatly aid in the early detection of the disease under consideration.

Physicians who are not health officers have a great responsibility. Let every physician urge vaccination upon all his patients until they are protected. Let those acting as physicians and surgeons to corporations or contractors urge the vaccination of all employés. The influence of the profession with school boards is ordinarily and deservedly great, and it should be used in inducing them to require the vaccination of all pupils. I have elsewhere urged[3] that every case of eruptive disease or suspicious illness be immediately called to the attention of health officers, in order that the responsibility may be placed where it legally belongs, and I again urge the importance of such action.

TUBERCULOSIS.

The question of the prevention of tuberculosis is now beginning to occupy the attention it justly deserves. The movement for the suppression of tuberculosis in Great Britain, the recent tuberculosis congress in Germany, the prominence which the subject is being given in lay magazines, and the general public interest in the question, are significant. It is somewhat strange that a disease causing such great loss of life should not sooner have caused a strong movement for its suppression, but the reason unquestionably lay in the apparent hopelessness of the task.

Until the discovery of the tubercle bacillus comparatively little in the way of intelligent preventive measures could be undertaken. With its discovery the usual reaction came, and sanitarians forgot the great influence of predisposing causes. Now, however, it would seem that the solution of the problem, though not even theoretically entirely accomplished, is in sight. With such a hope in view, great should be the energy of the profession. Colorado is constantly receiving new sufferers from outside, and she must continue to receive them in the interests of common humanity. No one would for a moment seriously consider a quarantine against their entrance to our state. But in the prevention of new cases the profession has a growing responsibility. The increasing frequency of the development of cases of tuberculosis in Colorado has been the subject of remark by a number of our best informed sanitarians. Of the deaths from tuberculosis occurring in Denver since 1892, the records of the bureau of health[4] show the following facts as to the place where the disease was contracted:

Year	Total Deaths from Tuberculosis	Specified as Contracted in Colorado	Per Cent. of Colorado Cases to Total
1893	435	49	11 26
1894	377	51	13.52
1895	428	64	14.95
1896	368	66	17.93
1897	489	88	17.99
1898	501	99	19.77
Total.....	2,598	417	16.05

Hardly any physician, no matter how extensive his personal experience, would have supposed that during the last six years 16.05% or about one-sixth of the total deaths from tuberculosis in Denver were caused by contracting the disease in Colorado. But the evidence becomes more startling when the constant increase of percentage is studied. From 11.26 in 1893 it passes successively to 13.52 in 1894, 14.95 in 1895, 17.93 in 1896, 17.99 in 1897, and 19.77 or nearly one-fifth, in 1898. Certainly it is time the profession and the public were aroused to the situation.

In 1894 the State Board of Health had printed for free distribution a circular entitled, "Consumption and How to Prevent

Its Spread in Colorado." The advice was timely; the offer for free distribution should have guaranteed a wide circulation of the document. But the information disseminated in this way did not check the onward march of the disease. In 1897 Dr. William P. Munn, as health commissioner of Denver, undertook to ascertain the state of professional opinion on the subject of tuberculosis, and, among other questions, asked this one:[5] "Do you favor supplying the patient with an educational leaflet in regard to care of the expectoration and excretions? The leaflet to be printed by the health authorities, but given to the patient by his own doctor." Out of 235 replies received, 219 physicians answered the question affirmatively. This showed a unanimity of opinion which is very gratifying, and this position of the profession should be encouraged by giving to every physician such leaflets for use in his practice. It is time that every physician treating a case of tuberculosis who fails to give full and intelligent information to his patient concerning the communicability of the disease should be made to feel the weight of united professional opinion in condemnation of his course. But the work is not fully done when patients under observation of physicians are instructed. Large numbers of tuberculous persons are not under the care of physicians. A great many are to be found on farms and ranches, living much in the open air and finding there all the medicine they need. But this does not prevent them from being sources of danger to others. Often they either own or are connected with dairy or stock farms. And it is not an uncommon practice for city physicians to recommend to their tuberculous patients that they secure positions on dairy farms or as drivers of milk wagons. Bovine tuberculosis, formerly unknown, or at least unrecognized, in Colorado, is becoming too common. It is quite probable that this increase is due to the presence among the cattle of tuberculous human beings. It was formerly thought that the milk of a tuberculous cow was innocuous unless the udder was involved, but the thorough researches of the Bureau of Animal Industry of the Agricultural Department have proven that under no conditions, however slight the infection, is it safe to use the milk of an animal with the disease. And it has further been demonstrated that it is dangerous to have a tuberculous person do the milking or han-

dle the milk afterward. Fortunately a thoroughly reliable test is to be had in the diagnosis of animal tuberculosis. Tuberculin as a diagnostic agent is far beyond the experimental stage. It is easy of application. It can be had for the asking of the Bureau of Animal Industry at Washington. Its use should be insisted on.

Boards of health throughout the entire state should forbid the sale of milk from any cow responding to the tuberculin test. All sellers of milk should be required to produce a certificate from competent authority of recent testing with tuberculin and freedom from reaction. Physicians should instruct all their milk-buying patients, and especially those with children, to demand proof of the absence of tuberculosis in the dairy herd. Further than this, dairies should be inspected regularly, and certificates given to those who keep their places in a sanitary condition and who do not allow tuberculous persons to do the milking or handle dairy products. In Indiana, the State Board of Health induced one man to construct a sanitary dairy and to carry out fully the instructions of the state board. He was then given a certificate of the fact. In a short time there was a great clamor on the part of the dairymen themselves for inspection. A like plan might work well here. While it is impossible under existing laws to compel the slaughter of tuberculous animals, the giving of a certificate to those, and those only, whose herds are tested and found entirely free from the disease would eventually create a sentiment which would prevent the sale of milk from tuberculous herds. Further than this, every animal found to be tuberculous should be so marked that identification would be easy, and the meat from said animal should not be allowed to enter the market unless killed under competent legal inspection. A system of registration would easily accomplish this result.

In the collective investigation made by Dr. Munn, above mentioned, about two-thirds of the physicians expressed themselves in favor of requiring the report and registration of cases of consumption.[6] In the education of the public toward restrictive measures this is one of the first and most important steps. The mere fact of a report being necessary calls attention in a

very effective way to the communicable character of the disease. I believe that in the larger cities of the state it is time to begin such a measure. In the country districts, especially in certain sections, it is probably not feasible at the present. If report of cases is required, the question is immediately raised as to further recognition by the health authorities. The time has not yet arrived for the placarding of houses or apartments, nor will it arrive for some years. But the time is at hand, in the larger cities of the state, when official cognizance should be taken of the disease by disinfection by the health officers of all apartments where consumptives have lodged. The plan of abating the spitting nuisance by public placards forbidding such habit on the sidewalk or in public places or conveyances is of great value, and a regulation making it a nuisance and misdemeanor punishable by fine ought to be made in such cities as Denver, Pueblo and Colorado Springs, and in the places which are notable resorts for the tuberculous.

The question of the isolation of inmates of hospitals, asylums, prisons and other public and semi-public institutions does not attract the attention it should. At the 1897 conference of State and Provincial Boards of Health the matter was duly considered, and the following resolution adopted: "Resolved, That it is the sense of this conference that tuberculous patients should be isolated from other inmates in our hospitals, asylums, prisons and penitentiaries."[7] Yet a study of the local situation recently begun by the secretary of the Colorado State Board of Health, though but just begun, justifies the assertion that very little attention is given the subject here, and that it is the common custom for tubercular and non-tubercular inmates of most institutions to freely associate and to occupy the same apartments without restraint and without disinfection. The profession can stop this if they will. It is time it were done.

To summarize. Every tubercular patient should be given an educational leaflet on the subject. In the larger cities and at resorts every case should be reported to the health authorities and a register kept. All apartments recently occupied by tubercular patients should be disinfected by the health authorities. The spitting nuisance should be abated by posters, and

in certain places by ordinance. No one should be allowed to sell milk unless the herds supplying it are proven free by the tuberculin test. No tuberculous animal should be allowed to be killed except under competent inspection. Tubercular and non-tubercular inmates of public and other institutions should be kept separated from each other.

[1]Public Health Reports, volume XIV., No. 1, page 43.
[2]Ibid, page 41.
[3]Colorado Medical Journal, May, 1899, page 204.
[4]Report of Bureau of Health, City of Denver, 1897-98, page 78.
[5]Ibid, page 54.
[6]Ibid, page 53.
[7]Proceedings of Twelfth Annual Meeting of Conference of State and Provincial Boards of Health, page 27.

PROBLEMS IN RURAL SANITATION.

BY J. TRACY MELVIN, M. D., SAGUACHE.

There are many things with which we become so familiar by daily contact that we lose sight of their imperfections and fail to continue in our efforts to improve them. A broken window pane that at once attracts the attention of a stranger is often so familiar to those who live in the house that they may all forget its existence. So with our problems in rural hygiene. The elementary, primary principles are so constantly disregarded by the great majority of the people that physicians themselves too often overlook this element in handling their cases.

In 1897 your committee on sanitation embodied in their report a reference to a few of these questions, and I would avail myself of this opportunity for presenting to you some further thoughts along the same lines.

The pollution of our rural water supply presents a problem no less vital than that which confronts urban communities, although it is well nigh impossible to impress its importance upon the people except in the face of severe sickness. Our usual supply is from open wells, and therefore presumably pure. Chemical examination, however, of the water from village wells, and

even from those of isolated ranches, often shows a surprising amount of unsuspected pollution.

Nearly all our wells in the mountain districts are very shallow, varying from six to sixteen feet in depth, and are usually dug through loose alluvial wash, then a strata of clay or adobe, and then through sand or gravel to the water bed. Fluids percolate through the surface soil very readily, and, finding the well the only opening through the subsoil, discharge into it drainage from a wide area. We usually find the country well most conveniently located for this purpose; often but a few feet from the stable yard, and but a short distance from the outhouse, with probably the kitchen drain in close proximity, how can it fail to become contaminated? Very often in our villages you will find all of these factors within thirty feet of the shallow well. Then, too, the yard must be often irrigated during the summer; after each time it is noticed that the water in the well is higher than before, proving the fact of surface drainage. Is it surprising, under such circumstances, that we constantly find in this water an excess of chlorides and of albumenoid ammonia? That all of his family are not sick all of the time, is the first argument the farmer uses to show that the chemical tests are fallacious.

Certainly the partial filtration, the more or less rapid current of the underflow, usually does prevent the contamination from becoming excessive; and perhaps, too, the constant use of a slightly contaminated water accustoms the system to its use; for we find most of the cases of summer complaint and diarrhoea, and even of typhoid, which are traced to this cause, occur in those who recently have commenced to use the water, or among residents whose vitality is lowered from other causes.

There is a too prevalent custom in some sections of the state of depending upon the irrigating ditches for water for drinking and domestic use. The danger in this is apparent, and no small proportion of our rural typhoid is directly traceable to this cause. We should not fail to impress this danger upon travelers as well as residents, for while the clear running water of many of these ditches seems inviting on a hot day, yet we know that running water will not purify itself to anywhere near the extent that it was formerly claimed to do; and how much less could we

allow any such claim for our sluggish irrigating ditches, as they meander through ranges frequented by large herds of domestic animals.

Chief, however, among all the offenders against public health, as well as against public decency, is the universal country outhouse nuisance. This I believe to be responsible, directly and indirectly, for more ill health in the country than any other one cause. It is usually unprotected, exposed and often dilapidated, thereby repelling a prompt attention to nature's calls. With usually nothing but a shallow hole dug in the porous soil, they poison air and water in every direction for many feet, even to such an extent that in the hot weather their vicinity is unbearable. Why intelligent, civilized people persist in continuing such a relic of barbarism without the most strenuous efforts to remedy it, is past my comprehension.

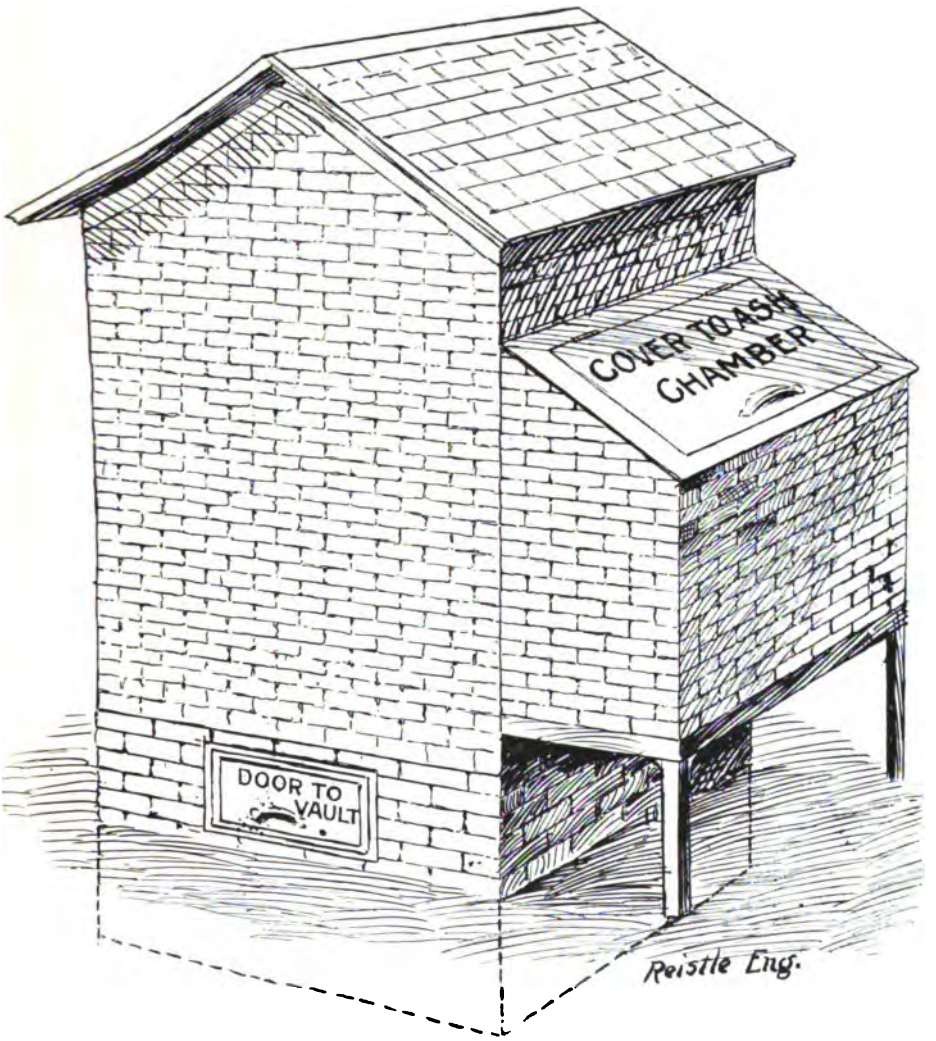
The greatest losses to the American army during the late war were not due to the enemy's bullets, but because an ignorant and careless volunteer soldiery, with the indifference bred into their minds by a life of constant familiarity with this nuisance, could not possibly be made to realize in a few short weeks of military instruction that an unprotected privy vault was more deadly than a gatling gun, but so it proved; and if now the American people in country districts will learn this lesson, the startling death roll from Camp Thomas and other military camps will not have been in vain.

To abolish the outhouse is impossible, for a water supply and sewage system are practically out of the question in rural communities. They can, however, be made less repulsive by educating the people on every suitable occasion to bestow more care and attention upon them. Many plans have been hesitatingly advanced for lessening the nuisance, but because they have not been persistently and forcibly kept before the people they have been misunderstood or carried out in a half-hearted way that led to early discouragement and dissatisfaction. The regular addition of limited quantities of slaked lime and of lime water to the contents of privy vaults and cesspools has proved wholly satisfactory in public works where sanitary conditions receive careful attention. In private work, however, it is seldom practical, because of the difficulty in keeping the material on hand

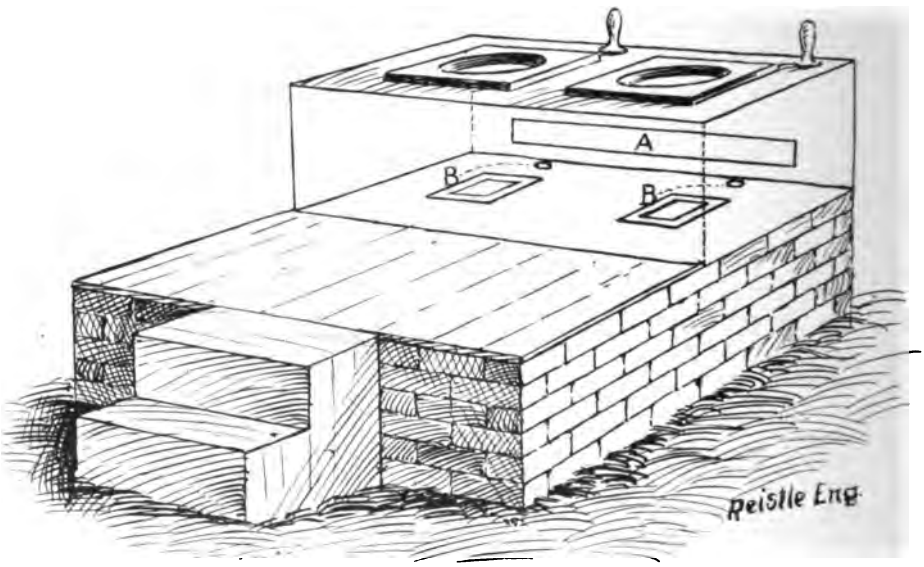
and the constant attention necessary. Dry earth kept in suitable containers, and added to the dejecta by hand or by automatic contrivance, has been largely experimented with and been partially successful. It is the basis of all the patent dry earth closets, which, although they work well, have not met that favor which they deserve. This has been due to the fact that the people have not been educated in a thorough knowledge of the fact that dry earth of almost any kind will desiccate and disinfect a large quantity of dejecta. A further reason is found in the fact that they all require a certain amount of intelligent attention and care, a thing which the average American man or woman will not give to any contrivance of this nature. Still the fact remains that for those who will take the trouble of caring for them, the dry earth closet may even be installed in the house, the same as the water closet in the city, to the great convenience of many families.

Ashes, either wood or coal, are often used in the place of dry earth, but the handling of them is unpleasant, although they are even more effective than the earth. Ashes are a constant waste product of every house. I was led several years ago to adopt a contrivance whereby they could be utilized for this purpose with little expense or trouble. It has worked so satisfactorily that a number of my friends and patients have duplicated it, and, as it may be built by any mechanic in any community, I would suggest it as a solution to this problem:

First an ordinary sized brick vault is built and cemented on the inside. The total depth should not be over four feet, half below the ground and half above. A frame with drop door about 16 inches by 3 feet is built into one side of the vault above the ground, to enable its contents to be removed. Upon this vault the ordinary outhouse structure is built, as plain or as comfortable as desired. Attached to the rear of this, upon a platform placed at the height of the top of the vault, is built a brick ash chamber, say 4 feet square, with a cover. An opening 4 inches by 4 feet is then made between the ash chamber and the outhouse opening, about 6 inches below the seat board. It is evident that ashes now poured into the ash chamber would pass at once through this opening into the bottom of the vault. We therefore take a board of the same size as the seat board, with open-



REAR VIEW OF DRY ASH CLOSET.



INSIDE VIEW OF DRY ASH CLOSET.

A.—Opening from Ash Chamber.
B. B.—Openings in false bottom with trap-door opening downward.

ings corresponding to those of the seat board and closed on the under side by trap doors fastened with strong spring hinges, and fit it into the space beneath the seat board and about on a level with the floor. This brings it two inches below the opening from the ash chamber. Ashes now poured into the ash chamber can only pass down to this false bottom, and when this is covered two inches deep, or to the level of the opening from the ash chamber, ashes will cease to flow even if the ash chamber is filled to the top. Any deposit now falls into this bed of ashes immediately over the trap. A sash cord fastened to the free edge of this trap and passing backward over a pulley and up to a handle above the seat board enables one to quickly drop the ashes and deposit to the bottom of the vault, the spring hinges close the trap, ashes will now automatically flow in up to the former level, and all is ready for a repeated use. This false bottom should be covered with zinc, and an ordinary fire hook should be kept to assist in spreading the ashes should they for any reason become clogged.

An improvement upon this single board for a false bottom is to have the bottom but eight inches wide, with sloping sides about twelve inches high attached, the whole lined with zinc and fitted up under the seat board. This form cleanses itself more readily. Thus without odor, special attention or nuisance, it will automatically continue to dry, disinfect and remove all discharges throughout the year. Once or twice a year the contents of the vault may be removed, when it will be found that there is absolutely no odor, moisture or offense of any kind, which is what prevents ordinary vaults from receiving proper attention. The desiccating and deodorizing power of ashes, properly applied, is marvelous.

In conclusion, we would call your special attention to the fact that the proper solution of nearly all the common every day problems connected with rural sanitation depends upon the continuous education of the people. The people at large are not going to intentionally jeopardize their own health, and if convinced of a danger will usually seek to remedy it, but this constant educational work must begin in every room of every public school, and must be continued, line upon line, both by written and spoken word, throughout after years. Otherwise daily fa-

miliarity with the evils will breed proverbial contempt for them; and, as we can have no sanitary inspectors or plumbing inspectors or any other law-made investigators of rural sanitary conditions, it depends in great measure upon each one of us to constantly strive by public and by private instruction to impress upon all within the sphere of our influence the vital importance of these questions and to point out the better way, not forgetting that the simplest, plainest, most elementary principles of hygiene are often the ones most frequently violated.

DISCUSSION ON THE PAPERS OF DRS. TYLER AND MELVIN.

Dr. J. N. Hall—I want to say a word as to the first of these papers. As to the reporting of chicken-pox, I think that would really be a very excellent plan for a board of health to adopt. Many of you will remember, no doubt, that in the clinic at Bellevue Hospital some years ago a typical case of chicken-pox was shown by one of the most competent of men, and yet within a few weeks vaccination became exceedingly popular in that institution; notwithstanding it presented all the typical symptoms of chicken-pox, it proved to be varioloid and the contagion spread to some considerable extent. If it is possible for such an incident to happen among the elect, what is to happen to the rest of us who have to deal with it comparatively infrequently?

One point as to small-pox epidemics I think escapes many of us. I suppose really, as a matter of fact, that the world is the gainer by an occasional mild epidemic of small-pox, owing to the fact that it calls the attention of everybody to the need for vaccination. If no small-pox came on, we will say, for forty years, a whole generation might grow up who had not had the horrors of this disease thrust upon them to such an extent as to lead them to see the vital necessity of vaccination. We all remember that epidemic in Gloucester, England, in which a whole community had grown up in defiance of vaccination. But finally the rabid anti-vaccinationists decided that under the stress of an epidemic it would probably be best for people to become vaccinated. Epidemics are really necessary to prevent these crazy ideas from spreading.

There is one point, and a very excellent one, made in this paper which has not been brought to my attention in any such visible way as it was by the statistics which Dr. Tyler gave us—the increase in the number of cases of tuberculosis originating in Colorado. Many of us will remember the discussion in our county society two or three years ago—I remember it particularly because of the fact that I reported thirteen or fourteen cases of phthisis originating in Colorado. Since that time I have seen, if anything, an increasing number. The one special point deserving to be spoken of at this time is that the death rate is undoubtedly greatly superior in the cases originating in Colorado to that in those which come from other places. In other words, those whose resistance, with even the favoring conditions which we have in Colorado, is so small that they still contract tuberculosis, almost invariably die. I have seen some half dozen cases since the thirteen or fourteen which I reported at that time, and of the entire nineteen or twenty there have been, as I recall it now, but two permanent recoveries. In other words, the death rate has been something tremendous.

Dr. M. Harrison—I would like to add to Dr. Hall's suggestion as to the reporting of chicken-pox, to report measles, as the initial rash of small-pox is generally reported as measles and, as I have had occasion to note recently, persistently upheld as measles. I think it would be well to include that in the reporting of contagious diseases.

Dr. A. D. Marks—I arise for the purpose of obtaining information rather than giving it, and that is this: On vaccinating a person successfully, as we usually term it, is that evidence that that person is fortified against an attack of small-pox? Is it not true that if a person is vaccinated once and is susceptible to the virus again he probably would be susceptible also to an attack of small-pox? If I remember correctly, the rule in Germany and France now is to vaccinate and re-vaccinate until the patient is unsusceptible to the virus and then it is considered that he will be rebellious to an attack of small-pox. That is what I have been teaching the people in our community; where people have asked me the question frequently whether the vaccination will protect them against an attack of small-pox I have

told them I was not certain of that—the thing to do, in my judgment, was to vaccinate and re-vaccinate until they would prove rebellious to the virus and then I thought they would be proof against small-pox. I would like to know the opinion of the profession on that subject.

Dr. J. Hawes—Vaccination, Mr. President, or even small-pox itself, does not protect against small-pox. I have a servant girl in my kitchen who twenty years ago had small-pox; I vaccinated her two weeks ago and it resulted in vaccinia very satisfactorily. That, however, would not be proof positive of the statement that I first made. Years ago, as I was leaving Liverpool, among the passengers who came aboard was a man well pitted with small-pox. When we got to New York he, with other passengers, was sent into quarantine. He was well broken out with small-pox, and he said it was the third attack that he had had. He certainly had two attacks of variola. I regard the health officers of New York capable of making a correct diagnosis as to the existence of small-pox.

When I noticed the title of Dr. Tyler's paper, "The Prevention of Communicable Diseases in Colorado," it occurred to me that I had a means of preventing communicable diseases that I might with profit, perhaps, bring along, as I have never noticed any one else using a similar apparatus. This is simply a "combination suit" made of blue denim, running from the top of the head to the bottom of the boots, outside of the boots; it has been soaked in a 1 to 500 bichloride solution over and over again, and if we now put it into a proper amount of water would probably give us 1 to 100 solution, because, in drying, the bichloride has always been left in the cloth. When I am called to a case of contagious disease I take this along. Now, this was not fashioned by Worth of Paris; it was formed by an obscure tailor of Greeley at my request. I used to put on an overcoat of rubber, go to my case, handle everything very gingerly, get out as quickly as I could, go home and change all my clothing and then tremble lest I had not gotten rid of all of the germs that I might have carried from that case of small-pox or diphtheria. Now I take this garment, throw some water on it so that I am sure I have a 1 to 500 or, more likely, 1 to 100

solution, put it on and visit my patient leisurely. You need not have any objection to my touching you (shakes hand with the president) although only two days ago I took, through these gloves, the pulse of a girl who was one of the worst broken-out cases of small-pox that I have ever seen. I will say the faith that the gentleman has in me makes further comment unnecessary. I pull this off, throw it down somewhere out-doors, having had my preparation of bichloride prepared, and as I step out I wet my face or whatever portion there may be that has been exposed to the air, and go away and leave the garment near the house of the patient until I come back. It will cost you a dollar if your wife will make it.

Dr. G. E. Tyler—In regard to the question asked as to whether vaccination protects—of course it does not in every case. There is no question about that. One of our recent cases was successfully vaccinated in January; the scar showed that it was one of the most successful of vaccinations, and yet he had quite a case of varioloid. Of course one vaccination does not always protect. But a recent vaccination, after exposure, will nearly always protect. If one is exposed to small pox and is immediately vaccinated it is very rare indeed, according to the reports received, that he takes the disease.

SURGICAL DISEASES OF THE KIDNEYS; CASES ILLUSTRATING SOME POINTS IN DIAGNOSIS AND TREATMENT.

BY LEONARD FREEMAN, M. D., DENVER.

Renal surgery is of such recent origin that many physicians have not realized its possibilities, owing, perhaps, to the spirit of conservatism, which renders progress slower, but safer. Ten or fifteen years ago it was considered dangerous and daring to cut into the substance of a kidney or to remove it; but these operations are now done every day with satisfactory results and with but little danger.

As in most other branches of surgery, extremely radical measures were at first employed, which were followed by more

conservative ones. Not long since it was the rule to at once remove diseased kidneys irrespective of what the affection might be; even movable kidneys were often treated in this manner. At the present time nephrectomy is resorted to in extreme cases only, and then more often as a secondary than as a primary operation.

The tendency of modern surgery is towards early operations, renal surgery being no exception to the rule. Unfortunately there are still many physicians who, through timidity or lack of information, permit their patients to suffer indefinitely, hoping that something may occur to relieve them, when a comparatively simple and harmless operation would remove the trouble at once and prevent irreparable damage. In most early operations, where extensive destructive changes have not taken place, the danger in competent hands is next to nothing. Henry Morris, for instance, reports 132 such operations with but two deaths.

The following cases have been selected with the idea of calling attention to certain interesting features:

Case 1—A woman, 23 years of age, well nourished and not neurotic, had suffered for years with pain and tenderness in the region of the left kidney, the pain following the ureter to the bladder and often running down the thigh. Recently she had been almost completely disabled. The symptoms were increased by motion and particularly by jolting.

Physical examination revealed nothing abnormal, which seemed to exclude movable kidney, tumor, hydronephrosis, etc.

Examination of the urine showed absence of albumen, sugar and pus, with presence of innumerable crystals of calcium oxalate, together with a few hyaline casts and red blood-corpuscles. As the patient was menstruating, it was thought that this might account for the blood, but catheterization failed to eliminate it. It was then imagined that the passage of the catheter might have liberated the few red cells which were present; hence when the menses had ceased the parts were cleaned and the urine again collected and examined. The result was the same.

The character of the urinary secretion, together with the absence of fever and the good general condition, appeared to exclude suppurative affections, tuberculosis, malignant tumors, and acute and chronic nephritis.

There were no evidences of disease of the spine or of adjacent organs.

There remained for consideration, calculus without infection, "idiopathic" nephralgia, and nephralgia due to irritating substances in the urine.

In favor of calculus was the increase of pain, tenderness and blood in the urine on motion, jolting of the body, or percussion of the lumbar region, with decrease of these symptoms during rest in bed. The presence of hyaline casts is considered a valuable confirmatory sign by Musser.

Against the presence of stone was the limited number of blood-discs and casts, and the fact that the patient had never passed any gravel.

As the blood might have been due to the presence of calcium-oxalate crystals, nitro-hydrochloric acid was administered until they disappeared; but the pain on exercise, the tenderness and blood remained.

The diagnosis seemed, accordingly, to lie between so-called idiopathic nephralgia and nephrolithiasis. The patient was informed that, although a positive diagnosis could not be made, an exploratory incision was indicated, owing to the severity and long standing of the symptoms and their stubborn resistance to medication. At the operation, in which the kidney was freely incised along its convex border and reunited by catgut sutures, nothing was found except an undue movability of the organ. Nephrorrhaphy was done, and union by first intention, without drainage, was obtained.

The case illustrates the difficulties in diagnosis sometimes encountered in affections of the renal organs, and emphasizes the fact that time, patience and minute investigation are often required, and even then failure may result. Attention is also called to the observation that blood in the urine may be due to movable kidney as well as to such conditions as nephrolithiasis, tumor, tuberculosis, irritating crystals, etc.

In this connection I desire to mention a feature of movable kidney occurring in this case, which I have not seen mentioned elsewhere: the absence of symptoms during pregnancy, due, perhaps, to the support furnished by an enlarged uterus.

Case 2—A strong, healthy man of about 40, with symptoms similar to those of the previous case. The urine was acid, contained a few red blood-corpuscles, some hyaline casts and an abundance of urates, and was of high specific gravity. A movable kidney was suspected, although, the abdominal walls being thick, nothing could be discovered on palpation; but treatment directed to the diminution of acidity and specific gravity of the urine cleared up the symptoms in a few days.

This case serves to remind us that in nephralgic conditions internal treatment should be tried before operation is resorted to; but it should not be lost sight of that exploratory incisions often give relief in bad cases of nephralgia where medicines fail.

Case 3—A movable kidney in a well developed and well nourished young woman of 25. In addition to the ordinary symptoms, the urine contained an immense number of hyaline, granular, and epithelial casts, without albumen. A nephrorrhaphy was done, union by first intention being obtained. Following the operation the number of casts rapidly diminished until they almost if not quite disappeared. The other symptoms were also recovered from.

Is it possible that serious danger to the kidney was here averted by timely operative intervention?

Case 4—A woman of about 35, with right movable kidney which descended as far as the crest of the ilium. A severe and persistent sciatica existed, which had resisted all treatment and which incapacitated the patient for work. This immediately disappeared on the performance of nephrorrhaphy, and has not returned at the end of more than eight months, except occasionally as a slight soreness at the sciatic notch.

Case 5—A well nourished woman, between 30 and 35, fell from a wagon some fourteen years ago, alighting on her back. Shortly after this she experienced, whenever she moved about, severe dragging pains in the pelvis, back and thighs, and irritation of the bladder. The symptoms disappeared after a rest in bed. Being forced to give up all her duties, she consulted a gynecologist, who promptly removed the uterus, tubes, and ovaries; but the old symptoms continued as before.

When the patient came under my care, the pelvis being empty, I examined the kidneys and found them both extremely

movable. After a rest in the recumbent position, the application of an elastic bandage about the waist, with properly adjusted pads, caused the complete disappearance of the annoying pains.

The patient, however, not liking the belt, insisted upon an operation. Double nephrorrhaphy was accordingly performed, with gratifying results. A stitch abscess, however, resulted in an annoying sinus.

This case would seem to indicate that before resorting to serious and mutilating pelvic operations, it would be wise, at times, to examine the kidneys. It also shows how easy it is to refer kidney symptoms to the pelvic organs.

Case 6—A man, about 30 years of age, well developed and in good health, had noticed all his life a tumor in the region of the left inguinal canal. This was supposed to be an undescended testis. There was no testicle in the scrotum on that side, and the tumor was of the size and shape of a large testicle and gave rise to a painfully sickening sensation when pressed upon. At irregular intervals inflammation and swelling took place, giving rise to much suffering and disability. The urine was normal.

At the operation it was only after the most careful scrutiny that what was supposed to be a testicle was found to be an undeveloped kidney lying in the inguinal canal. An atrophied testicle was lodged beneath the kidney, and a hernial sac lay by its side. The kidney was filled with a black fluid, and its ureter was a mere fibrous cord resembling a vas deferens. A radical operation for hernia, castration, and nephrectomy were simultaneously performed, an uneventful recovery resulting.

Case 7—A boy, 12 years old, fell fifteen feet from a tree, striking his left side on a projecting root. He was collapsed for a time, suffering great pain and passing blood in the urine. In a few hours the temperature went to 103°, the pulse became rapid, and a tense, tender swelling appeared in the left side above the ilium. No blood was noticed in the movements from the bowels, but blood had not been looked for. On the third day, the high pulse and temperature continuing, an exploratory incision was determined upon, especially as an extra-peritoneal rupture of the colon was suspected in addition to injury to the kidney. The kidney was found torn almost in two, and sur-

rounded with a large quantity of fluid blood and urine. The bowel was uninjured. Recovery, after drainage, was rapid and complete.

The propriety of operation in injuries of the kidneys presenting such marked symptoms will not be questioned. It enables us to check hemorrhage and forestall the formation of an abscess, and save the peritoneal cavity from possible contamination.

Case 8—A man about 35 was shot in the left side with a 45 calibre bullet, which passed downwards through the lower portion of the pleural cavity, wounded the kidney, and passed out to the left of the lumbar spine. There being much extravasation of blood and urine, an incision was made down to the kidney for purposes of drainage. Infection, which had already taken place, was soon pronounced, and at the end of several weeks secondary hemorrhage set in. This was at first easily controlled by packing, but it suddenly became so profuse as to almost exsanguinate the patient. As a desperate resort, a nephrectomy was rapidly done without anaesthesia; the renal pedicle being secured by clamps, which were left in place. The operation required but a few moments. The patient rallied under the liberal use of saline solution, and ultimately recovered. For a long time a fistula remained, through which urine frequently regurgitated from the bladder when the individual was in a recumbent position.

From general considerations, and from the course of this particular case, I am inclined to believe the safe procedure in secondary renal hemorrhage to be a prompt nephrectomy. The unusual feature of regurgitation of urine from the bladder is worth noting.

Case 9—An emaciated old man, about 70, suffered from profuse and constant renal hemorrhage for which no cause could be detected. His condition was such as to discourage operative intervention, even if anything could have been found to operate for. He had been strongly addicted to the eating of crude opium. The drug had been suddenly taken from him just before the hemorrhage began. Death from exsanguination shortly resulted. At the autopsy, made by Dr. W. N. Beggs, of Denver, no cause for the bleeding was discovered. The kidneys were normal, except for some moderate fibrous changes which accompany age.

Was the excessive hemorrhage connected with the opium habit, or was it due to the mild interstitial nephritis?

Case 10—Perinephritic abscess, originating without apparent cause in a young man of about 30. Pain and tenderness was at first of such an uncertain character, and the general symptoms so pronounced, that the case was treated as typhoid fever for three weeks by the physician in charge. At the end of this time attention was strongly directed to the back, but even then only the slightest possible fulness could be detected in the left lumbar region. Incision revealed a large abscess surrounding the lower part of the kidney, but not connected with it. Recovery.

Case 11—A man of over 60 strained himself severely on the right side of the abdomen, producing an acute inguinal hernia, to which a truss was applied. After a time fever developed, which continued many weeks. When examined, the temperature was 103°. The right thigh was flexed on the abdomen and the iliac fossa moderately tender, although no swelling could be felt. A peculiar soft emphysematous tumor existed near the external inguinal ring, which crackled beneath the fingers and could be reduced within the abdomen, but which lacked the usual characteristics of a hernia. Prolonged observation failing to throw much light on the nature of the case, an incision was made above Poupart's ligament, and the peritoneum turned up. A large retroperitoneal abscess was found, extending down from the region of the kidney, and with a finger-like prolongation alongside the inguinal canal. The cavity contained a great amount of gas and comparatively little pus, although there was no connection with the bowel. The peculiar tumor mentioned above was due to the presence of this gas. An inguinal hernia existed also. A lumbar incision was made for the sake of better drainage. The patient reacted well from the operation, but died from the effects of a heavy fall from his bed during the night.

In such cases, the painful contraction of the thigh, together with fever, should call attention to the probable existence of an abscess closely connected with the ilio-psoas muscle.

Case 12—A man between 30 and 35 had suffered for several years with recurring abscesses of the prostate gland, following

a perineal operation for stone. There was great irritability of the bladder, which continued, without apparent cause, after the prostatic trouble had been relieved. There was also moderate fever, together with increasing debility and loss of weight. Although it was known that some suppurative disease of the right kidney existed, there was not sufficient pain and tenderness to call marked attention to the organ. No tumor could be felt; but the muscles were too rigid to permit a satisfactory examination. It was finally decided, however, to cut down upon the kidney. Five abscesses were encountered, containing several pints of pus. The kidney, which was incised and drained, was found pushed over to the median line. The abscesses were not connected, and were discovered one after the other by means of an exploring-syringe. The bladder symptoms at once disappeared and the patient made an excellent recovery.

This case calls attention to the fact, which is not widely enough appreciated, that irritability of the bladder may be due to affections of the kidneys. The illusion may be so great that the bladder has been frequently considered to be the seat of the trouble and treated accordingly.

In opening purulent collections about the kidney, we should always satisfy ourselves that more than one abscess does not exist.

Where there is reason to believe, from examination of the urine, that the kidney is involved in the suppurative process, I believe it is wise to open and drain that organ at the time of operating, although some advise against this course.

Case 13—A woman, perhaps 40 years of age, had suffered for years with pain and other symptoms of such character that ovarian and bladder trouble had been diagnosed. Finally an enlarged, movable kidney was discovered, and a nephrotomy revealed several abscess cavities containing three calculi of moderate size. Drainage was followed by complete recovery. Much damage to the kidney and great suffering might have been prevented by earlier operation.

Cases 14 and 15 were cases of suppurative nephritis (possibly pyelonephritis) following parturition. The urine was cloudy, with pus in suspension, and there was pain and tenderness in

the right lumbar region. A free incision revealed in each case an enlarged and softened kidney, with numerous foci of infection scattered throughout its substance. Drainage and recovery.

These successful cases indicate that even in so-called suppurative nephritis, with disseminated inflammatory foci, nephrotomy, instead of nephrectomy, may result in cure.

Case 16—Congenital hydronephrosis in a girl of 12. The tumor was enormous, occupying the entire right side of the abdomen, and extending several inches beyond the median line. At intervals the swelling became more tense, accompanied by pain, vomiting, headache, diarrhoea, etc. Ordinarily there was but little discomfort. On one occasion, at least, a tumor the size of a fist had appeared upon the left side.

The right kidney, exposed through a lumbar incision, was distended into a thin layer, but the hydronephrotic sac was principally from the pelvis. Although it seemed scarcely possible that any secreting substance remained, the kidney was not removed, because of the probable unsoundness of the other organ, and because of the difficulty attending the removal of so large a cyst. The kidney was, however, swung around on its axis, in order to correct, if possible, a hypothetical faulty insertion of the ureter. In the course of two or three days an abundance of urine was flowing from the lumbar incision.

This case demonstrates that when the renal substance appears to be totally destroyed it may still be capable of performing its functions.

I believe it to be preferable, where the soundness of the other kidney is uncertain, to refrain from making a primary nephrectomy. Later, when the hydronephrotic sac has contracted, if a fistula remain, a plastic operation may be attempted upon the ureter. If this should fail, a nephrectomy may then be done if desired.

It should be kept in view, however, that a live patient with a urinary fistula is much preferable to a dead patient. When last heard from the fistula in this case was rapidly closing.

Cases 17 and 18—During the past year I have encountered one case of pyelitis and one of suppurative nephritis due to the colon bacillus, both following fulminating cases of appendicitis

with localized purulent peritonitis. No operation on the kidneys was made in either instance. The case of pyelitis recovered, but the suppurative nephritis terminated fatally at the end of seven weeks.

Cases 19 and 20—I have also seen two cases of pyelo-nephritis due to the colon bacillus, arising from catheterization of paretic bladders following distention. Both terminated fatally, with symptoms of general sepsis. Physicians should be on the lookout for these colon bacillus infections and meet them promptly with urotropin or salol.

Case 21—A well built, healthy looking girl of 18. Since she was 4 or 5 years of age she had complained of pain and tenderness in the region of the right kidney. At first the attacks of pain were rather infrequent, perhaps once a month or not so often. They gradually became more frequent, until during the last five months constant distress has been present. At the time of examination there was much tenderness over the kidney, both anteriorly and posteriorly, although the pain had shifted to a point just internal to the anterior superior spine of the ilium. No history of renal colic or the passage of gravel. The right kidney seemed to be somewhat loose. Jarring the body or pounding upon the lumbar region produced sharp pain.

An examination of the urine disclosed cystine crystals in considerable quantity, together with a moderate number of leucocytes, a few red blood-corpuscles, and many epithelial cells. There were no casts. The urine was neutral, with a normal specific gravity, and contained no albumen.

The diagnosis of cystinuria was made, and it was considered probable that a calculus existed in the right kidney, although the symptoms might be attributed to a movable kidney or possibly to the presence of the sharp cystine crystals.

While the patient was under observation she fell down a flight of stairs, striking heavily on the affected side. At once the pain, which had existed steadily for so many months, absolutely disappeared, and at the end of a week, when I lost sight of the case, had not reappeared. Tenderness also rapidly subsided. This abrupt cessation of symptoms would seem to point to the existence of a stone, which suddenly, under the influence

of the trauma, shifted its position and ceased to be a source of irritation.

Cystinuria is such an extremely rare disease that Delafield in the *Twentieth Century Practice* asserts that but seventy-five cases have been reported. The etiology is involved in obscurity, and no reliable treatment is known. Dr. J. N. Hall, who saw the case with me and independently arrived at conclusions similar to my own, developed the interesting fact that the patient could not wear a silver ring during the last five months owing to its turning black almost as rapidly as it was polished. The explanation of this phenomenon undoubtedly is that those affected with cystinuria exude a certain amount of sulphur through the skin. Cystine itself, as is well known, contains about 26 per cent. of sulphur.

The patient was told that if her annoying symptoms returned an exploratory lumbar incision would be advisable.

DISCUSSION.

Dr. H. G. Wetherill—Dr. Freeman's paper deals with a most interesting and important topic, one in regard to which the opinion of surgeons at the present day is undergoing some change. I undertake to state that the profession will come more and more to the conclusion, as we seem to be doing at the present time, that operation upon movable kidney for the cure of reflex nervous symptoms is often futile. I should very much like to hear from Dr. Freeman's case a year from now. I would much rather hear from it a year from now than at the present time. The hysterectomy and removal of the ovaries and tubes has utterly failed to relieve the nervous symptoms; I should expect Dr. Freeman, who is honest and conscientious in such matters, to tell us that his nephrorrhaphy had also failed, for I should expect that his case, like most others of its class, would relapse and these nervous symptoms be reproduced. Many others who have been doing it are inclined to abandon the operation, except in cases where the symptoms are very pronounced and where they can be undoubtedly referred to the kidney and to the kidney alone.

There is one other point in this connection which I think we should consider at this time, and that is the evolution through

which we are going in reference to operations upon the kidney. It is pretty clearly demonstrated that ordinary suturing of the kidney is not effective in permanently holding the kidney in place; that something must be done in the nature of such an operation as Dr. Senn has advised, i. e., cutting down upon the kidney, fastening it in position by straps and allowing the wound to granulate about the kidney. It seems to be the only way of permanently anchoring a kidney in position. The sutures are known to tear out or stretch so that the kidney if placed in proper position at the time of the operation can not be depended upon to permanently remain so.

Dr. Freeman—I have nothing to say in closing the discussion, except to acknowledge the truth of Dr. Wetherill's assertion that these cases very often relapse. They do not always relapse. I would not be at all surprised if some of the cases upon which I have operated should relapse in the course of time. I only hope that they will not.

REPORT OF A SERIES OF SURGICAL KIDNEY CASES.

BY C. B. LYMAN, M. D., DENVER.

The paper I am presenting to-day is perhaps a little misleading in its title, as I am calling it "A Report of Surgical Kidney Cases." It was my original intention to present brief histories of a few kidney cases which have been subjected to operation, but I have since concluded to incorporate with these reports the mention of a few others—surgical cases but not operative, or rather which were not operated. I wish also to report one case, not a kidney case at all, which was seen in conjunction with one which was; the reason for this being that the two cases presented very similar physical signs, and serve to illustrate the fact that the diagnosis of abnormal conditions in the renal region is often difficult and sometimes impossible.

There are many surgical conditions which one must be prepared to recognize if he would successfully diagnose and handle

kidney cases. I do not propose to consider them all, or enter into a discussion with regard to them, but will speak of such conditions as are illustrated by the cases which I have the honor to report.

I would first speak of displacement of the kidney—movable and floating kidney. This is a condition which is without doubt much more frequent than many suspect; a condition which may exist through a lifetime without having produced a single symptom and be discovered only by accident, or which, on the other hand, may cause untold misery and may go unnoticed, even unsuspected, by the physician.

It may be either a congenital or an acquired condition; it is usually acquired, and 90 per cent. of all cases occur in women and most often in the case of those who have borne children. The degree of displacement varies greatly, may be so extensive, even, that the kidney is found lying within the pelvic cavity; the symptoms encountered bear no relation to the degree of displacement. The right kidney is the one usually displaced; we may have it lying behind the peritoneal membrane, cases which are called movable, or the organ may have a true meso-nephron, cases which are called floating; the latter are usually congenital in origin.

The symptoms in these cases are varied, as will be shown by the reports of a few cases which I have selected from the records of a considerable number.

Case I.—Mrs. A————, aged 34, married and the mother of two children, the youngest being 13 years of age. During the last eight years she has been a patient of mine and during that time she has never had an illness of any account. Three years ago she came complaining of occasional attacks of dull pain in the right side under the last ribs; she said that she had suffered from this for some time, but had paid no particular attention to it as it has caused her no particular annoyance. The bowels were habitually constipated. The attacks of pain were frequently accompanied by nausea and a mild condition of indigestion. Examination showed the right kidney to be quite movable, coming down to the level of the umbilicus when the patient was in the upright position; it was tender to pressure and could

be easily replaced into its normal position. Avoidance of severe exertion, rest in the horizontal position for a portion of each day, attention to any and all disorders of digestion and general rules regarding health were the instructions given her. Operation was advised if at any time the symptoms became severe enough to make life very uncomfortable or cause deterioration of the general health or disease of the kidneys. It is now four years since she first consulted me and she is still unoperated, is in good health and suffers but little discomfort, except after running the sewing machine or riding the bicycle for long distances, both of which were forbidden.

Case II.—Mrs. B———, aged 31 years, married and a nulli-para, first consulted me in November, 1898, giving a history of having had an attack of acute appendicitis one year previous in Atlanta, Georgia, from which attack she recovered without operation. Since that time she has had constant pain in the right iliac region; she had been told by several physicians that it was due to chronic appendicitis or to adhesions and that she should be operated and have her appendix removed. She came to me for the purpose of having the operation done, which, before making an examination, I admitted was the proper thing to be done.

Upon examination I found the right kidney lying in the right iliac region and easily palpable, tender to pressure, the pressure being followed by the characteristic pain which she had suffered for a year. The organ was easily replacable to its normal position, and after replacement the appendicial region was free from pain and tenderness. An operation was advised if the distressing symptoms continued. Nothing was done other than the replacement of the kidney at the time of the examination, and general instructions were given as in the previous case. It is now eight months since I made the examination, and during this time she has never suffered from a return of the pain. The only explanation I can offer for the relief from pain, is that the pedicle had become slightly twisted, sufficient to cause congestion of the nerve sheaths but not sufficient to interfere with the patency of the ureter, and that my manipulations had relieved these abnormal conditions.

This case illustrates the fact that an acute paroxysm of pain from a movable kidney with other attending symptoms might

easily be mistaken for the symptoms of an attack of acute appendicitis, if the kidney be sufficiently movable to reach the normal position of the appendix. Nothing but thorough physical examination will enable one to differentiate between them, as most of the classical symptoms of appendicitis *may be* found in cases of movable kidney.

Case III.—Mrs. C———, aged 29, married, and the mother of two children, the older being 4 1-2 years old. Two years ago was called to see her, at which time she was having a very severe attack of abdominal pain, being most intense on the right side; it was sufficiently severe to require the administration of morphine hypodermically. She gave me the following history: During the year previous she had had a number of attacks similar in every particular to the one I saw her in. She had been seen during these attacks by different physicians, one calling it an attack of acute indigestion, another intestinal colic, another the passage of gall stones, and the fourth said it was due to uterine disease and instituted treatment which was continued for several weeks. An examination, made after the severe paroxysm of pain had been relieved, showed the pelvic organs to be normal; the right kidney was quite movable and the moment the organ was palpated the patient said "There is where all my pain comes from; what is it you are touching, doctor?"

Directions were given to this patient, such as I gave to the others; these directions were carefully followed out. Since that time she has given birth to her second child, which is now nine months old. The patient has never had a severe attack of pain since I first saw her, but after over-exertion she has some dull aching in the region of the kidney.

These three cases illustrate three different types of this condition: although in each of them the symptoms were severe at the beginning of the attack, all of them by observing a due amount of care have been comfortable, and none of them have as yet asked to have an operation performed. Many patients will obtain relief from the most aggravating symptoms if they will carefully follow the general rules given them by their physician; few will require operation. If they are not relieved by such a course as I have outlined, artificial supports will, in all

probability, be of no service and operation will be required. Of operative measures there are only two: the one, anchoring of the kidney in its normal position by one of the several well known suture methods; the other recently brought forward and described by Deaver in an article published in the June number of "The Annals of Surgery." He claims, and rightly I think, that the sutures do not support the kidney but simply steady it in its normal position until the inflammation set up by the sutures has bound the organ to the surrounding tissues. He claims, also, that there is some danger, when the sutures are put through the kidney tissue, of urinary extravasation due to the puncture of some of the uriniferous tubules by the needle. He has personally seen a case where urinary infiltration *did* take place and nephrectomy was the ultimate result.

His method consists of dissecting the fat off the kidney, delivering the organ through the wound, if need be, to do it. He then takes two strips of iodoform gauze, passing them around either extremity of the kidney, the two ends of each strip protruding from the wound; iodoform gauze is then packed around the kidney, between it and the first strips. The first strips are then brought over the packing and tied; a pad of gauze is placed on the anterior wall of the abdomen over the kidney, dressings are applied and the whole retained by adhesive straps and bandages. The packing and strips are removed at the end of seven to ten days; the wound is kept packed until it is entirely healed. He reports nine cases which he has thus operated, and in all of them the results were entirely satisfactory. In one of these cases he was enabled to examine the kidney some time afterwards through an abdominal wound made for an entirely different condition and found the organ firmly held in its normal place. I believe the operation to be a rational one and an improvement on the usually employed methods, as it will certainly tend to increase the amount of granulation tissue, which is in reality the true support which one gives the organ in any and all of the operative procedures.

Hydronephrosis: Under this head I have one case to report.

J. M——, aged 3 years, whom I was called out of town to see in February of this year. At that time I obtained the following

history: Twelve days previous to my visit he had a distinct chill followed by fever and vomiting, the vomiting continuing off and on during the twelve days; there was marked constipation and night-sweats. Eight days before my visit he began to complain of pain in the right side of the abdomen, just below the ribs; at night he would cry out in his sleep from the pain; he sometimes complained of pain in the right loin. The mother said that she had noticed a lump in the right side; she said that the urine had been normal in color, but scant in amount. Examination: Temperature 99, pulse 96. Abdomen distended and tympanitic. There was a mass to be felt in the right abdomen lying between the lower ribs and the crest of the ileum, visible to the eye. The mass was rounded, smooth and was tender to pressure; there was indefinite sense of fluctuation. A provisional diagnosis was made of suppurative kidney or perinephritic abscess. The child was removed to Denver and taken to the hospital. Urinary examination showed nothing abnormal; the temperature never rose above 99 or the pulse above 100. Free catharsis was obtained from small frequently repeated doses of sulphate of magnesia. His condition remained unchanged until on the third day the mother reported that the child had at very frequent intervals voided large quantities of urine, followed by an almost complete disappearance of the mass. He was kept under observation for a week and then sent home. Ten days afterwards I received word from the mother informing me that the child had had another attack similar in character to the first one. Frequent and copious evacuation of the bladder was followed by a disappearance of the mass as in the first attack. A letter of recent date from the mother reports the boy to be in perfect health with no return of the trouble.

Without comment, I desire to report, in connection with this case, another one which does not belong to the class designated by the title of this paper.

C. S———, a boy aged 5 years, was referred to me by Dr. Horn, with this history obtained at the time of the examination: The child had been ordinarily well since birth; had a severe attack of bronchitis a year before this time. The mother says

that two months ago, while giving the child his bath, she noticed that there was a swelling on the right side of the abdomen below the ribs, which she could both see and feel and which was not especially tender to pressure or manipulation. Examination showed a boy well developed and of healthy appearance. There was a bulging of the outline of the abdomen on the right side as viewed from either the front or back; this was caused by a mass which could be easily felt extending from the loin behind forward nearly to the median line and upwards under the ribs where the outline was lost; it extended downwards to the crest of the ileum. It was somewhat tender upon manipulation; deep fluctuation could be made out. The temperature was normal and the pulse 82. A positive diagnosis was not made at the time of the examination. Operation was advised, however, the nature of which was left uncertain until the mass was explored. This was done a few days later. The mass was opened posterior to the peritoneum by a lumbar incision. A large cavity was found containing over a pint of thin flocculent pus, without odor; the cavity extended to the vertebral column and well upwards under the ribs and downwards into the iliac fossa. In the abscess cavity was found a small fragment of carious bone. Examination of the vertebrae by way of the abscess cavity did not determine the presence of disease of the bones, but a point was to be felt which I believe had been the seat of disease prior to this time and which was the origin of the abscess; the pus, instead of taking the usual course downwards along the sheath of the psoas muscle, had collected at this point, posterior to the peritoneum. The patient made a perfect recovery, the cavity becoming entirely obliterated in six weeks. A plaster jacket was then applied to prevent recurrence of the spinal disease.

I report these cases together because of their great similarity in physical signs, the great dissimilarity in actual condition and cause, and also to emphasize again the fact that often a positive diagnosis of abnormal conditions in the renal region is impossible without an exploratory operation. Had the first patient been an adult, collection of the separate urines by means of the Harris urine separator would have aided us very

materially. In some cases the careful use of an aspirating needle is justifiable. The cause of the obstruction to the escape of the urine in the first case was never determined. I believe it to have been due to a kink in the ureter which was relieved as soon as the pressure from the tympanites and faecal collection was removed. Cases of acute hydronephrosis, relieved spontaneously, are not common. The condition is usually chronic in character, the obstruction to the outflow of the urine being a permanent one; collection of urine continues until the cortical substance of the kidney is atrophied from the pressure and we have nothing left but a large fibrous sac filled with fluid. The condition in these cases is usually of gradual development and the symptoms are mild, the most prominent one being the gradual formation of a tumor in the side with possibly a diminished daily secretion of urine and some discomfort or pain. A differential diagnosis between hydronephrosis and a condition such as existed in the second case reported, pyonephrosis, suppurative perinephritis, abscess from a previous attack of appendicitis, abscess of the lower portion of the liver, distended gall bladder, growths of the kidney and other conditions, is often impossible without either an operation or an autopsy.

Suppurative Kidney: Suppuration in the kidney becomes a surgical condition when the organ is diseased to such an extent that it proves to be a menace to the general health, or when it can be demonstrated that a condition of nephrolithiasis exists, or when there is an obstruction in the urinary tract which prevents the drainage of the pus through the normal channel. The most common form of suppurative kidney is that where the pelvis of the organ is the location of the pus. This condition is usually the result of bacterial infection, which may be of gonorrhoeal, tubercular or septic origin, the infection traveling upward from the bladder or urethra, or it may be metastatic in origin. This condition is often accompanied by the presence of renal stones which may have existed before the suppuration or which may have been an after result. The infection may extend to the perinephritic tissue, either through the unbroken kidney tissue or through a direct channel established between the pelvis of the kidney and the surrounding tissues. Under this class I would report the following case:

Mr. J———, aged 38 years, single, came under my care in the wards of the county hospital suffering from a condition which he said had been pronounced tuberculosis of the bladder by two physicians in New York City. He presented the following history: He had had gonorrhoea several times, the last time being eighteen months previous to his coming under my care. He seemingly recovered, but in four or five weeks the discharge returned and was followed by frequency of urination and distress over the bladder and at the end of the penis; the urine contained considerable sediment at that time. Three months after the onset of this attack of gonorrhoea he began to have pain in the right side of the abdomen below the ribs and in the back on the same side. He was under treatment in one of the out-patient hospitals in New York for some time, where the diagnosis of tuberculosis of the bladder was made; he received no benefit from the treatment. Nine months before I saw him he began to lose flesh, the loss amounting to about thirty-five pounds. The pain in the right side had been continuous up to the time I first saw him in May of this year; he had never had a chill, had had some night sweats, and urination had been frequent, especially at night. He was admitted to the hospital on May 3, 1899, and was transferred from the medical service to the genito-urinary by Dr. Whitney, the visiting physician. An examination showed emaciation, anaemia; he complains of frequency of urination, pain over the bladder and at the end of the penis, and pain in the right side between the last ribs and the ileum which was often severe enough to keep him from sleeping at night. Since entrance has had some night sweating, no chills or vomiting, his appetite has been fairly good, his temperature has ranged from normal to 101 degrees and his pulse from 72 to 100. He complains of tenderness over the right side and says that he can not bear the weight of the bed clothes.

Examination of the chest showed nothing abnormal. There was a fullness of the right side of the abdomen and of the right loin which could be easily demonstrated by inspection; there was rigidity of the abdominal walls over this area and a sense of deep fluctuation could be made out; pressure caused pain. The urine had a specific gravity of 1015, alkaline reaction, al-

bumen present; there was a large amount of sediment consisting of pus cells, mucus, bacteria and phosphatic crystals; gonnococci or tubercle bacilli could not be found. A small aspiration needle introduced over the area of fluctuation demonstrated the presence of pus; examination of this pus did not reveal the presence of either gonococci or tubercle bacilli. Operation was decided upon and was done on the following day. An incision was made in the loin, beginning one-half inch below the last rib and close to the spine, and was carried downward and forward in a circular direction to a point one inch above the anterior superior spine of the ileum, opening the abscess cavity. This cavity was found to be divided into a large number of small cavities by numerous septa; these were freely broken up until we had a cavity extending upwards posterior to the liver, between that organ and the diaphram, as far as the finger would reach, and downwards to the iliac fossa.

The kidney could be seen and felt through the incision; it was enlarged; the pelvis was distended. An incision was made into the pelvis of the kidney, disclosing a cavity containing about six ounces of pus; as the cortical tissue of the organ seemed to be in fair condition it was deemed best not to remove the kidney. All of the cavities were thoroughly irrigated with formaline solution 1-2000 and drained by tubes, one of the tubes extending into the pelvis of the kidney. To-day, six weeks after the operation, we find the pus cavities fairly well obliterated; there is still drainage from the kidney pelvis through the wound; the urine is clear and free from pus. There has been continual improvement in his general condition—a gain of twenty pounds in weight, with return of the digestive functions to their normal condition. A nephrectomy may still be needed in this case, provided drainage should continue indefinitely through the wound. There has been no attempt made to collect the separate urines to determine whether there is drainage from this kidney through the ureter.

I believe we should always leave a kidney if there is *any* secreting tissue left and a patent ureter, or even if there is a possibility of one being able to secure patency. Nephrectomy should be left to be done at a subsequent time, if it is proved

to be needed, for many of these patients are in such a physical condition when first operated on that if a nephrectomy were added a fatal result would ensue.

In this case we have two conditions which are often seen independently as well as conjointly. Perinephritis, with the formation of an abscess, often occurs as a primary condition without there having been extension of infection from a suppurative kidney. It may be the result of local injury; it is occasionally of metastatic origin, the source of infection being located at some distant point; it may arise from immediate infection from acute appendicitis, or from disease of the ascending colon, liver or adjacent organs. The diagnosis is often not positively made until the operation is done, as it might easily be mistaken for a suppurative kidney, appendicial abscess, abscess of the lower portion of the liver, abscess having its origin in disease of the spinal column, empyema of the gall bladder, hydatids of the liver or hydronephrosis.

Free incision and perfect drainage offers the only hope of cure. If we have in addition to the perinephritic abscess a suppurative kidney, the question of the advisability of doing a nephrectomy will often come up. I think that in almost every case it will be wisest to defer the nephrectomy, even if positively needed, until a subsequent time, allowing our patient in the mean time to regain some of his lost vitality, which he will surely do after free incision and good drainage. During this period the kidney or what is left of it will shrink quite materially, making its removal an easier matter.

Nephrolithiasis: Under this head I wish to report two cases. The first one will come under both this heading and the preceding, as it was a case of suppurative kidney accompanied by calculi.

Case I.—J. B.————, male, aged 34 years and married. I am not able to give you the early history of this case other than to say that for a number of months previous to November last he had been passing large quantities of pus in his urine and at times blood also; that he had suffered more or less pain in the right renal region; that there had been a gradual decrease in weight, strength and general health. A diagnosis of renal

calculus had been made by his physician, Dr. S. D. Van Meter, who operated him in November, 1898, removing two fragments of stone from the pelvis of the right kidney—those numbered 1 and 2 on the accompanying photograph—and which weighed 97 grains. At this operation the edges of the incision in the kidney were stitched to the edges of the external wound and the pelvis of the kidney drained by a tube. After this operation the patient improved in health and strength and was able to resume his usual occupation, the sinus still discharging both pus and urine quite freely. After two or three months he began to lose flesh and strength; it was thought that possibly there had been some of the calculi left behind; the X ray showed no evidence of their presence, however. On March 16th, 1899, I was called to see him during Dr. Van Meter's absence from the city; I found him with a temperature of 105.8, pulse 150, mildly delirious and with all of the signs of general septic infection. As the patient refused absolutely to go to a hospital, I was obliged to operate him at his house. The seat of the original incision was freely opened and a pus cavity encountered containing about twelve ounces of fluid. After free evacuation of this cavity the kidney itself could be easily palpated and was found to be soft and mushy to touch; it was freely opened, disclosing the presence of about six ounces of pus. From the cavity I removed three large fragments of stone, those numbered 3, 4 and 5 on the photograph; their combined weight was 147 grains, making the total weight of stone removed at two sittings 245 grains. All of the cavities were thoroughly washed out with formaline solution and drained with tubes. There was apparently but little normal kidney tissue left and a nephrectomy was clearly indicated; this was not done, however, owing to the lack of assistants and the inconvenience of the surroundings; it was decided to defer this until some subsequent time. The septic symptoms quickly subsided and in three weeks the patient returned to work. The sinus is still discharging, and at some future time we will remove the remains of the kidney, which is of no use and a constant source of danger to the patient.

The interest in this case centers around the fact that at the first operation all of the calculi were not detected, even though a thorough examination was made. In these cases we should not rest until we have explored every portion of the organ most thoroughly. The other interesting feature in the case was that the X rays did not show the presence of the stones, although they were of considerable size. We can not rely upon this method of examination in these cases, as a negative result proves nothing.

Case II.—This case, although it was not operated on, is of interest. Mr. B———, aged 29 years. When I was called to see him I found him suffering from very severe pain in the region of the left kidney, which also extended downwards to the left testicle. Morphine given hypodermically had but little effect. A diagnosis of renal calculus having been made, and as I had given all the morphine which I dared to give, I administered chloroform, keeping him mildly under its influence for two hours. I then allowed him to come out from under its influence completely; the pain was mild in character and morphine sufficed to keep him fairly comfortable. There was no subsequent attack of pain. Three months after this he came to my office, complaining of having had pain in the bladder during the act of urination for four or five days, and that at the present time he was having pain in the urethra. At the time of the visit he located the pain at the peno-scrotal angle; there was tenderness at that point. A sound was passed into the urethra and met with an obstruction at that point, which was thought to be due to a calculus lodged at that point. With a pair of long slim dressing forceps I was able to seize it and remove it. It is now three years since this occurred and the patient has had no further trouble.

Foreign Growths: Under this class I will report two cases.

Case I.—Baby B———— was three years old when I was called to see her. I had attended the mother when this baby was born; it had never had any illness of any account since birth. I was called this time to see her because the mother said that the baby's belly was growing very fast; this increase in size she began to notice about three months previous to this

time. Examination showed the abdomen to be very prominent. On the left side was found a large mass, apparently having its origin in the renal region and extending downwards and forwards into the abdominal cavity, reaching nearly to the umbilicus; it was tender to pressure, hard, rounded in outline and having a smooth surface. The mother said that the child had been complaining of pain in that region for some time, but she paid no attention to it; she also said that the child had lost its appetite, was constipated, and at times had passed urine which she thinks might have contained blood. A diagnosis of foreign growth of the kidney was made and it was supposed to be a sarcoma.

An operation was advised and was done a few days afterwards. The kidney was found to be greatly enlarged; it was removed with very great difficulty through as large an incision as could be made. There was considerable loss of blood, the operation was followed by severe shock, and in spite of the use of infusion of salt solution and the free use of stimulation death resulted in twelve hours. Microscopic examination of the growth removed showed it to be a round-cell sarcoma; there was no normal kidney tissue to be found in any portion of the growth which was subjected to examination.

This case illustrates the typical new growth found in children; practically all of the cases of new growth found in young children are of this type. These cases are very unsatisfactory ones to encounter, as operation is very apt to be followed by death or return of the growth at some subsequent period. Under this heading I wish to report one more case, one which I consider the most interesting of them all. In the literature at my command I find no record of a case of similar character; even those who have written special works on the kidney make no mention of the condition which I found present in this case.

Case II.—Mr. O. S———, a young man aged about 22, was referred to me January 10, 1899, at which time he gave me the following history: He said that he came to Colorado about a year prior to this time for "lung trouble;" had had no illness of any moment before that time. In September, 1898, he had an attack of typhoid fever from which he recovered promptly, and

in November was convalescent. On November 30, he was taken with pain in his left leg, accompanied by swelling; this proved to be an attack of phlebitis of the left femoral vein, and this confined him to bed during the whole of the month of December. For two weeks previous to the time I first saw him he had been having pain in the region of the left kidney, both in front and back; the pain at times was very severe, sufficiently so to prevent sleep at night and to require an occasional dose of morphine. He complained also of great tenderness in the same region, being unable to bear the weight of the bed clothes. He said that shortly after the first manifestation of pain he began to pass bloody urine which at times had the appearance of being almost pure blood. It was at this point that I was called in to see the case, at which time I obtained the history as I have just outlined it. At this time the urine was quite bloody, though some samples showed no blood on inspection. He was having night sweats, had had one chill and an irregular run of fever, ranging from 99 to 102 degrees; the temperature at the time of the examination was 102 and the pulse 120; the respirations were 30 per minute and very shallow, and he said that deep inspiration brought on severe pain over the kidney region. He was constipated; his appetite was very poor; he had had occasional attacks of nausea and vomiting; he also complained of having had severe headaches paroxysmal in character.

There was marked pallor of the skin and emaciation—estimated weight about 95 pounds; the tongue was coated, dry and cracked, the abdomen was distended and tympanitic, and the whole abdomen was tender to palpation but especially so in the left hypochondrium. Beneath the last ribs, extending downwards and forwards toward the umbilicus, could be felt a mass, smooth on its surface, resembling the normal kidney in shape but much larger. It was quite tender when palpated and was hard in consistency; when pressed between the two hands the patient experienced severe pain. There was tenderness in the left loin close to the spine; there was some tenderness along the line of the left ureter and he said that the pains which he had been having extended downwards to the left testicle. The case was examined several times during the next three days; no further

symptoms were noticed, the urine gradually lost its bloody look but still contained blood disks and albumen, and the sediment, which was considerable in amount, consisted of blood disks, broken-down cells and detritus. A diagnosis was not made, but all who saw the case thought it to be malignant disease of the kidney. Operation was advised and was done on January 18, 1899, at which time the patient was in somewhat better condition than when I first saw him; the morning of the operation his temperature was 100.8 degrees and his pulse 132. Chloroform was used as an anæsthetic. An incision was made parallel to the twelfth rib and about one-half inch below it; from this an incision was carried downward in a vertical direction to the crest of the ileum. When the kidney was reached it was found to be smooth, very hard, dark red in color and mottled in appearance. An exploring needle was thrust through the cortex in various directions, no stone or pus was found, and each puncture was followed by the escape of a small amount of thin, dark red serous fluid. The capsule was then cut through; it was very much thickened but could be easily peeled from the kidney. The kidney substance was of a very dark, dull red color, and all portions of the kidney which could be inspected had a similar appearance. It was decided to remove the kidney; it was dissected loose from the surrounding tissues; it was delivered through the opening with the greatest of difficulty, on account of its great size, and it was necessary to extend the horizontal incision for some distance anteriorly, stripping back the peritoneum.

After it had been partially delivered an attempt was made to pass a temporary ligature around the pedicle, and while this was being done the whole kidney tore loose from its attachment to the pedicle, and much to the surprise of all there was no hemorrhage. The remains of the capsule were dissected away. The ureter was isolated from the vessels and ligated; a ligature was then passed through the pedicle, and when these ligatures were drawn tight they cut completely through the mass, although only moderate force was being used. There was a tremendous hemorrhage from the renal vessels; they were caught with large clamps, which were left in place, and the cavity was packed with

washed iodoform gauze. The clamps were removed on the third day. There was considerable shock during and after the operation, but infusions of salt solution and forced stimulation brought him out of this condition. The subsequent progress of the case was without any incidents of especial importance: his general condition improved very rapidly and at the end of eight weeks the cavity was obliterated and he was discharged from treatment. At this time he weighed 165 pounds, which was more than he had ever weighed, and he said that he was in better health than he had been in for years.

Examination of the kidney removed showed it to be uniformly enlarged, being about five times the size of the normal kidney; it weighed eighteen and one-half ounces; it was of a dark red color throughout; it was hard but very friable, almost granular. It was turned over to Dr. W. B. Fenn, pathologist to The Denver University Medical School, who made the microscopic examination, and who reports as follows:

"The kidney was large, firm, dark red in color and appeared of similar structure throughout. A piece was selected which seemed to be representative, sections were made and stained with carmine. I found the tubules contracted and all the capillaries engorged with blood. Some parts of the section would not take the stain and gave indications of being in an early stage of necrosis."

My theory of the case is that an embolus having its origin in the femoral vein was carried and lodged in the left renal vein, that this completely shut off the venous circulation from the kidney, which in turn became very much engorged. This engorgement must have been tremendous to produce such an enlargement of the organ, and I think that the pressure was sufficient to stop entirely, or at least to a great degree, the flow of blood in the renal artery and we had a clot form there, which condition would account for the beginning necrosis which was noted by the pathologist. We had here a complete infarction of the kidney, a condition which, as I have already said, I can not find mentioned anywhere in the literature on the kidney.

It was certainly a case where positive diagnosis was impossible without an exploratory operation. That nephrectomy

was the proper treatment in the case I believe is true, though I must admit that if the conditions could have been made out before the operation I would have hesitated.

This case illustrates, again, the truth of the statement which I have made several times already, that the positive diagnosis of many abnormal conditions found in the renal region is often impossible without exploration.

I hope that I have not bored you by the recital of the histories of these cases. I have selected these particular cases from the records of a considerable number which I have had, because each one of them was of interest to me in some particular, and I hope that you may see something in them which will be of interest to you also.

THE TREATMENT OF PELVIC SUPPURATIONS.

BY H. G. WETHERILL, M. D., DENVER.

My consideration of this subject presupposes that purulent accumulations in the pelvis are conceded to be subject to the same general laws applying to the treatment of such accumulations elsewhere in the body, i. e., the pus must be evacuated and, so far as it may be possible to do so, a secondary or mixed infection of the abscess cavity and the newly made raw surfaces prevented.

One very important distinction must be made, however, in regard to a certain variety of pelvic suppurations, as this form presents a pathologic condition peculiar to itself and admits of radical treatment possible nowhere else in the human body. I allude to those suppurations of the lumen of the fallopian tube that have arisen so slowly as to permit of the occlusion of its abdominal ostium and the retention of the purulent accumulation in the sack so formed. Such conditions are common, and the opportunity they offer for the complete removal of the pus, together with the infected sack in which it has been retained, is much too good to be lost. Occasionally a somewhat similar pathologic condition arises in the vermiform appendix, but with

this organ infection is apt to be of a far more virulent type and the conservative process less firmly and safely established; consequently its rupture and the formation of a circumscribed intra-peritoneal abscess, or an infection of the free peritoneal cavity, is a much more frequent occurrence from this source, and the radical and complete operation is proportionately limited in its scope with the organ in question. However, the general likeness in the etiology and course of infections of the uterine and cecal appendages up to a certain point, and the frequency with which an abscessing vermiform appendix is found in the true pelvis, just above the pelvic brim, or even adherent to an infected right fallopian tube, and the nice questions of differential diagnosis that not infrequently arise therewith, all require that these diseases be regarded as closely allied to each other and considered surgically from about the same standpoint.

With due regard to the admitted uncertainty of detailed intra-pelvic diagnosis, my experience with pelvic suppurations has been such as to lead me to believe that the method and route for their surgical treatment is in almost every particular instance clearly indicated by unmistakable signs. It has never seemed to me that there could be a question about the advisability of attacking through the vagina any accumulation of pus that was distinctly pointing in that direction or that could be easily and safely so reached, provided the abscess can not be previously determined to belong to the sacculated or encysted variety already referred to, in which event it must appear that the abdominal route offers greater advantages for the completion of a radical and curative operation, beside affording the best opportunity for the rational treatment of intestinal adhesions and other complications. These indications have seemed so clear that I have been quite unable to find sufficient ground for the controversy so long waged between the so-called vaginal and abdominal operators. Each is right, each is wrong, and, as is usually the case, the true way lies between them.

The surgeon who would attack a large pelvic abscess by the abdominal route when it was pointing in, or easily accessible from, the vagina, would have great difficulty in convincing his colleagues that his chosen procedure was justifiable; and with

most large pelvic abscesses these are the conditions, and a deviation from the obviously wise course must lay one open to criticism.

Almost without exception, patients having such abscesses are profoundly septic and present all the grave symptoms of absorption, and they are consequently in no condition to withstand a severe and altogether unnecessary abdominal operation. Owing to the proximity to the bowel, the extensive burrowing, and the displacement of the viscera, the risks of an abdominal operation are greatly increased under such circumstances; for peritoneal contamination is inevitable and such abscesses are, as a rule, very foul from contact with fecal matter or intestinal bacteria, and the virulency of a peritonitis from such a source, with the reduced resistance and vitality of such patients, must be dangerous in the extreme.

The indications are for the evacuation of the pus by the free opening of the abscess through the vault of the vagina, the cleansing and draining of the sack, and the institution of sustaining and supporting treatment to tide the patient over the crisis in which she is found; and to do at a future time a radical operation if it becomes necessary, a contingency that in the vast majority of cases does not present itself, as the procedure already adopted is often all that is necessary to effect a cure. These cases should be treated just as the wisely conservative surgeon would treat a large abscess in the right iliac fossa of appendix origin. The abscess will be opened, cleansed and drained, and no risks will be needlessly incurred in an effort to make the operation a radical and final one. This may be better and much more safely done at a future time if it becomes necessary, and in only a very small proportion of such cases does such necessity arise.

What has been said must not be construed as in any way applying to those intra-pelvic abscesses occasionally met with in which it is necessary or expedient to drain, or make a counter opening for procuring better drainage, through the inguinal space above Poupart's ligament, when this can be done without invading the peritoneal cavity. Such a procedure is not only quite possible, but may be necessary at times. Abscesses of

large size occupying the iliac fossa may raise the peritoneum well away from Poupart's ligament in the same way that an intraligamentous extra-uterine pregnancy does, and in such cases it is easy and practicable to evacuate the pus by the upper route without traversing the peritoneum.

During the years 1897 and 1898 five cases of large pelvic abscess have been operated upon by me, and I quote the histories of these cases briefly to better illustrate the character of the work necessary and the results attained.

M. G., age 42, married, last labor ten years ago, past health good, menstruated freely for eight days every three weeks. One month ago began with an attack that was diagnosed a peritonitis, and since that time has been very ill; has lost flesh, and had constant nausea, vomiting and diarrhœa, chills, fever and sweats. When I saw her she was thoroughly septic, pale and anemic. She had a profuse, offensive, purulent vaginal discharge, which was rusty or bloody at times. On examination she was found to have a uterine polyp protruding from the cervical canal and dangling in the vagina; this was one and one-half inches long and three-quarters inch in diameter. The cervix was forced high up behind the symphysis pubis, and the pelvic basin back of the uterus was filled with a tense mass that was found to reach nearly to the umbilicus on bimanual palpation and gave an indistinct sense of deep fluctuation. The patient was removed to St. Luke's hospital, and under anæsthesia the mass was made out to be a large abscess, and it was at once freely opened, washed out, and a large-calibre retention drainage tube, packed about with iodoform gauze, introduced through the opening back of the cervix. About a pint of highly offensive pus and broken down blood clot was evacuated. The polyp was then amputated, and the uterine cavity carefully but thoroughly curetted, washed and packed with gauze. The subsequent history of this case was uneventful. The sack was flushed daily until the obliteration of its lumen made the procedure no longer necessary, when the tube was removed and the vaginal opening was allowed to heal. The patient left the hospital in about three weeks and rapidly regained her health. She has had no inconvenience whatever from any pelvic discomfort since that

time, and when examined some weeks later the great mass of exudate about the uterus had almost disappeared.

In but one of these cases was a secondary abdominal operation needed to effect a complete and permanent cure.

N. K., age 40, married, last labor twenty-two years ago, no miscarriages. When seen in consultation with her physician, she presented a fluctuating temperature record and the ordinary evidences of concealed suppuration and auto-infection. Though no fluctuation could be made out by the examining finger in the vagina, the forward displacement of the cervix and the presence of a hard mass of exudate in Douglas's pouch indicated this to be the source of the symptoms, though there was little tenderness on pressure and no tumor was palpable above the symphysis pubis. Her physician had made a diagnosis of pelvic abscess and had asked me to express an opinion and operate in case operation seemed indicated. Under anæsthesia an indistinct deep fluctuation was felt, and an incision through the posterior vaginal vault, followed by a careful digital exploration and dissection in the direction of the mass on the left, soon opened into a pocket of offensive pus high up on that side. This was flushed and drained and the patient returned to her bed. At the end of about a week, the symptoms being renewed, another examination under ether was made and a small pocket of pus was found and treated in a similar way on the right side, after which her recovery was steady and satisfactory, with the exception of an open tract through the vaginal vault which continued to discharge; she was, however, free from pain and in excellent general health. Nearly a year later, the discharge continuing from the drainage tract in spite of the lapse of time and persistent treatment, further operative measures were advised, and she went to St. Luke's hospital and I opened the abdomen, removing a small sack from the left side of the pelvis. It was the tube and ovary of that side, and its contents were finding a way out through the old tract in the vagina. The appendages on the left side were also removed, as they were not in healthy condition. Tier sutures were placed in the fat abdominal wall, and drainage of the pelvis was provided for through the vagina. With the exception of an abscess in the abdominal wall, her

recovery was uneventful and she was at last completely cured of the disease and restored to health, the tract in the vaginal vault promptly closing when the drainage was removed.

M. D., age 33, married, last labor eight years ago, last abortion six years ago; present illness about five weeks, though she had not been in good health before. She was brought in to St. Anthony's hospital from over the range, and in her very serious condition the trip proved to be more than she was able to bear. Her pulse and temperature were high on admission, and she was weak and exhausted to an extreme degree. I found her profoundly septic, and with a tremendous tumor in the left side reaching above the umbilicus and pointing in, and distinctly fluctuating through, the vagina. As in the cases already reported, the uterus was pushed high up behind the symphysis pubis, and the vault of the vagina was seemingly entirely occupied by the enormous abscess. In order to allow of some preparatory treatment and cleansing, rest, and stimulation, operation was set for the following morning, but the patient passed a very restless night and but for constant stimulation and good nursing would not have survived the night. She was found to have a pulse of 160 in the morning and it was so thin and weak that it could be counted with great difficulty. The evacuation of the abscess offering her the only chance for life, it was undertaken and a very large amount of most offensive pus was drained from two sacks, the larger one being on the left side. Flushing and packing were hurriedly done and she was returned to her bed and strong stimulation ordered, but her vital forces steadily failed and she died at about 6 o'clock the afternoon of the same day. There can be little doubt that an early evacuation of the pus through the vagina would have saved the life of this patient.

B. C., age 38, married, last labor thirteen years ago, two abortions. This patient was taken ill suddenly about July 1, 1898, with acute pelvic pain, and from that time till the time of my seeing her, on August 12, she had constant pain, fever, and, during the latter part of the time, profound septic symptoms. She presented an enormous pelvic and abdominal tumor, prominent on the left side of the abdomen and reaching quite to the um-

bilicus. As in the other cases, the cervix uteri was crowded up behind the symphysis pubis, and the true pelvis was almost entirely occupied by the tumor. No doubt existed as to the nature of the tumor, as it fluctuated in all directions, and immediate operation was advised. The patient was removed to St. Luke's hospital and the pus evacuated and the sack flushed and drained. As is so often the case, the contents had a most offensive odor. The patient made a rapid and uneventful recovery, and the sack was rapidly closed in upon by the adjacent organs and quickly obliterated. The woman left the hospital in about four weeks and has remained well since, having no return of pain or other symptoms requiring attention.

G. M., age 44, married. This case presented many of the features of the last one; it was treated in much the same way, and resulted in a perfect cure of the pelvic abscess. After the drain was removed from the vaginal vault, the drainage tract rapidly closed and all symptoms disappeared.

These cases illustrate the variety of pelvic suppuration that in my opinion must be primarily treated by vaginal incision and drainage, which in the great majority of instances is all that is necessary to secure a cure; if, however, it does not do so, a secondary abdominal operation of a radical nature may then be done at a time when all the conditions favor a successful termination.

The forward and upward displacement of the cervix, which has been noted in four of these cases, is an important diagnostic point and, taken with other indications, will help to a solution of such problems as these; for a large accumulation of pus in the pelvis most often occupies the pouch of Douglas, and ultimately crowds the uterus out in the forward and upward direction. Other growths sometimes do the same thing, but not so quickly, nor to the same degree.

In regard to the surgical treatment of small tubal, ovarian, or appendix abscesses—I have very little to say in this connection, for the reason that I regard the problem as settled, to all intents and purposes, until something better supercedes the excellent results obtained by abdominal section. Dr. W. W. Prior and others have for some years operated upon this class of cases

through the vagina as a routine procedure, and in a paper recently read before the Philadelphia Obstetrical Society he reported a series of over one hundred cases so treated, with no deaths and a large percentage of cures as a result. While this seems a particularly favorable showing, a careful reading of his paper and of the discussion which followed leads to the conclusion that for patients of the average surgeon the old way through the abdominal wall is much the safer and better way. We certainly must conclude that, as a whole, the surgeons of this country are not ready to adopt the vaginal route as a routine for these cases of small sacculated abscess. The advantages the abdominal route offers for the treatment of adhesions and complications, the facility with which appendix conditions may be dealt with, and the absolute certainty with which hemorrhage may be controlled and the adjacent viscera protected, are far too great to be given up.

Notwithstanding this rational preference for the abdominal route in the great majority of cases of this kind, it will be conceded by most operators that occasionally cases come to us in which the vaginal operation may be quite clearly the operation of choice. Again we are brought face to face with the fallacy of routine procedures for all cases of a class. The personal equation must also be considered; for, if an operator acquires a special dexterity in the performance of a particular operation, that operation becomes for him the operation of choice, and the operation of greatest safety, in a case for which it would not be chosen by another.

I have found the route by the vagina to be a satisfactory one in selected cases for many intrapelvic conditions that I had formerly preferred to attack through the abdominal wall, and, as my experience with operations by this route has increased, the legitimate scope of the procedure for me has seemed to grow greater. I have had some most excellent and satisfactory results in vaginal operations for small tubo-ovarian abscesses; and when I encounter cases that seem suitable for this operation I shall give the patient the benefit of the better drainage from the most dependent point of the pelvis that this route offers, besides advantages of less risk of hernia, shock and infection that must be conceded to belong to it.

The treatment of pelvic suppurations must be governed, then, by the great principles underlying the surgical treatment of like pathologic processes elsewhere. Pus must be evacuated by the route best adapted to all the conditions of the particular case under consideration, and with due regard for the special skill and dexterity of the particular operator in the performance of the operation of choice.

As a rule, large accumulations of pus in the pelvis may be more safely attacked from below, and small sacculated ones from above, the pubic symphysis, but this rule, like many others, is subject to exceptions.

DISCUSSION.

Dr. I. B. Perkins—I wish to compliment Dr. Wetherill on his paper, which so clearly sets forth the proper way to manage pelvic abscesses. Up to within the last few years the abdominal route has been mostly used and the mortality has been high. Since the vaginal operation has come into general use the mortality has been lowered more than 60 per cent., and in the near future we may reasonably expect to see it brought still lower.

When an abscess is large and bulging into the vagina it is a simple matter, by free incision, to drain it and effect a cure; but when the abscess is not so large, or is high up in the pelvis, or has few adhesions, the task becomes more difficult. These abscesses nearly all originate from tubal infection; they are usually located at the fimbriated end of the tube, and lie posterior to the broad ligament and frequently against the posterior and lateral portion of the uterus. By making a posterior incision, and then burrowing up behind the uterus and broad ligament with the finger until fluctuation can be detected and the abscess located, it can be successfully punctured and drained. It is sometimes necessary to burrow a considerable distance before reaching the mass, and care should be exercised so as not to invade the abdominal cavity. If there is any question on this point a median exploratory incision will be of value and does no harm.

Sometimes these tubal abscesses, when on the right side, reach up almost to the appendix and may be mistaken for appendicitis. These can be most safely reached by incision above Poupart's ligament, and they heal much quicker than appendiceal abscess cavities, as the latter poison is much more virulent.

I recently had a case in which I was in doubt as to the best place to open. I made a median incision for the purpose of exploration and found that the uterus and tubes were perfectly free except the fimbriated end of the right tube. This contained an abscess, surrounded by a mass of adhesions, which reached almost to McBurney's point and was adherent to the abdominal wall. I closed my median incision, sealed it with bichloride collodion, and then made an incision above Poupart's ligament as Dr. Wetherill describes and drained externally with the best of results.

Dr. H. G. Wetherill—The question as to the way in which a pelvic abscess should be attacked is a matter of individual opinion and judgment. Perhaps all we could say about it at this time is that it requires a nice discrimination to determine which route is going to be the desirable route in the particular case. A celebrated American gynecologist has within the last year or two advocated the vaginal route for operation upon extra-uterine pregnancy, and has reported a number of successful cases. He, however, incidentally reports a number in which he had to make a secondary laparotomy in order to control the hemorrhage.

This interesting and instructive case of Dr. Perkins demonstrates very clearly that a vaginal operation for extra-uterine fœtation can rarely be admissible, if it be so at all. I think that for extra-uterine pregnancy the upper route is almost invariably the better one.

TUBAL PREGNANCY AND DERMOID CYSTS: REPORT OF A CASE.

BY I. B. PERKINS, M. D., DENVER.

Extra-uterine pregnancy occurs sufficiently frequent that most members of this society have had opportunity to make clinical observations on the subject.

Dermoid cyst of the ovary is also not infrequent. Statistics compiled by several observers of large experience show that from three to seven and a half per cent. of all ovarian tumors are dermoid cysts. They usually occur in but one ovary. Dr. Kelly, in twenty-one cases, had one case in which both ovaries were involved.

It is generally believed that all dermoids are congenital in origin, except it is thought by some that an occasional one in the ovary may be acquired through the interruption of an ovarian pregnancy.

The case which I wish to report to you to-day had dermoid cyst occurring in both ovaries, and a pregnancy in the right fallopian tube with almost complete obliteration of the left tube.

Mrs. A., age 41, American born, is an intelligent woman and gave me this history: She menstruated first when twenty years of age; the flow was scant at that time and did not occur again for three years. She was married at twenty-three and gave birth to a son three years later, which was fifteen years ago. This was her only pregnancy. At the birth of her child she had "child-bed" fever, so called, and was confined to her bed eight weeks, a part of which time she was unconscious. She had a high fever, chills, sweats, distention of the abdomen, and much pain, but does not know whether there was an abscess or not—thinks not.

Her child was three years old when she next menstruated, and the flow was scant and had a bad odor. At her most regular times she menstruated only three or four times a year, frequently going six or eight months.

In the fall of 1898 she menstruated twice in thirty days, the only time this ever occurred; flow was always scant. From girlhood she frequently fainted. Seven years ago she had an attack of peritonitis and was ill five weeks.

I saw her first May 8, at 1 o'clock a. m. Found her suffering severe pain in the right side of pelvis and abdomen. A tumor, which was quite tender, could be felt on the right side, extending a little above McBurney's point. Pain came on four hours before I saw her. It was dull at first and later became quite severe and lancinating. From January 30 to April 14 there was no flow. On this latter date she noticed a scant stringy flow, which continued until May 7, a period of twenty-three days. Shock was intense; temperature was 95.8, pulse 60 and scarcely perceptible at the wrist. Respiration was sighing, face and lips were blanched, and patient nauseated and vomiting.

Diagnosed extrauterine pregnancy with rupture, and advised immediate operation. Gave a hypodermic injection of ergotine, also one of one-thirtieth grain of strychnia. Three hours later consent to operate was obtained. During this time the strychnia had been repeated three times, and one hypodermic of one-thousandth grain of atropia had been given. Removed the patient to St. Luke's hospital and operated at 5:30 a. m. Temperature when she went on the table was 97.5, pulse 82. Anaesthetic was chloroform for a few minutes and ether the remainder of the time.

As soon as the patient was brought into the operating room the injection of normal salt solution under the breasts and in the loose tissues on the sides was begun, and was continued during the entire operation, a little more than two quarts being used.

A few moments sufficed to explore and curette the uterus, which was found to be four inches in depth and turned to the left side. It contained considerable shred-like tissue, supposed to be decidual membrane. Removed rubber gloves, which were used during the curettement, and opened abdomen, making median incision about three inches in length. Found abdomen full of dark blood and blood clots. Enlarged incision to about six inches and washed out abdomen with hot solution. Changed patient to Trendellenburg position. Found a three-lobe cyst of left

ovary, larger than a teacup, resting above the tube and ovary on the right side and firmly adherent to the intestines. The fimbriated end of the left tube was adherent to the cyst and a small cord (the remains of the tube) extended to its uterine end, which was about two and one-half inches in length and distended with a dark fluid. It ended abruptly, resembling a small sausage.

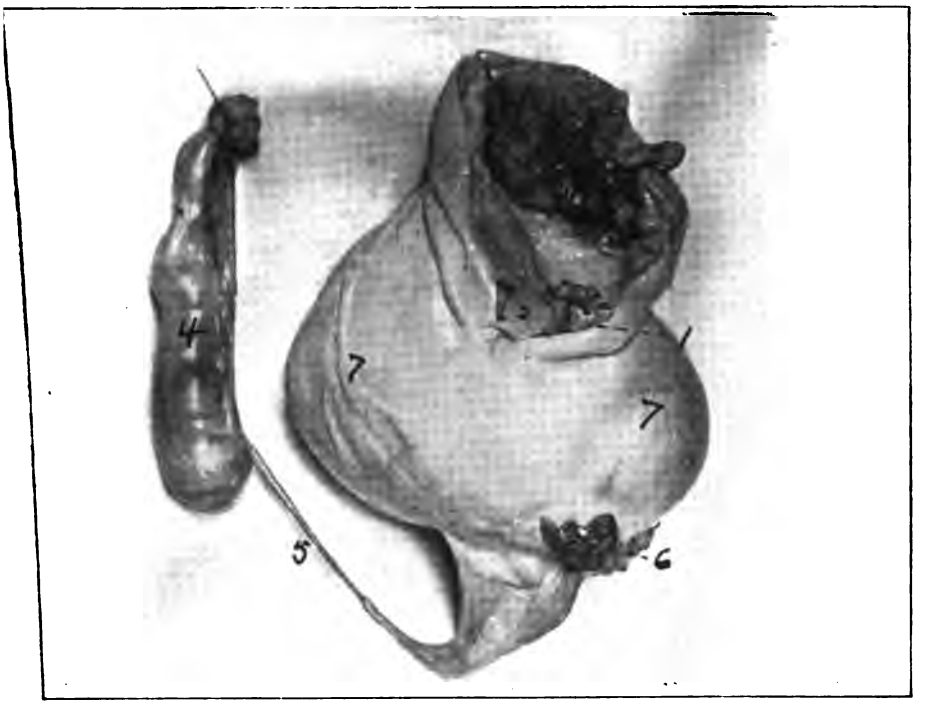


Fig. 1.

1. Teeth.
2. Bone.
3. Skin covered with scattering hair.
4. Tube distended with a dark colored fluid.
5. Remains of a portion of tube.
6. Fimbriated end of tube.
7. Cysts containing clear fluid.

This tumor got its blood supply through its adhesions to the intestine.

After removing this tumor, the ruptured and still bleeding tube on the right side was readily reached and removed. The

sac, containing a three or four-weeks' foetus, was not broken. Before getting a photograph of it in the amniotic fluid, however, the sac received a puncture sufficient to allow the fluid to escape, but still retains the foetus, as you can plainly see.

The right ovary was found to contain a number of small cysts and was removed. One of these cysts was broken in the

Fig. 2.

1. Fœtus in sac.
2. Cavity in tube at point of rupture.
3. Fimbriated end of tube.
4. Uterine end of tube.

removal and its contents (a viscid dark-colored liquid) escaped into the abdominal cavity. The abdomen was thoroughly washed out with normal salt solution, some of which was left in the cavity to be absorbed. Abdominal drainage of washed-out iodoform gauze was used and the abdomen closed with interrupted silkworm-gut sutures. The operation required forty min-

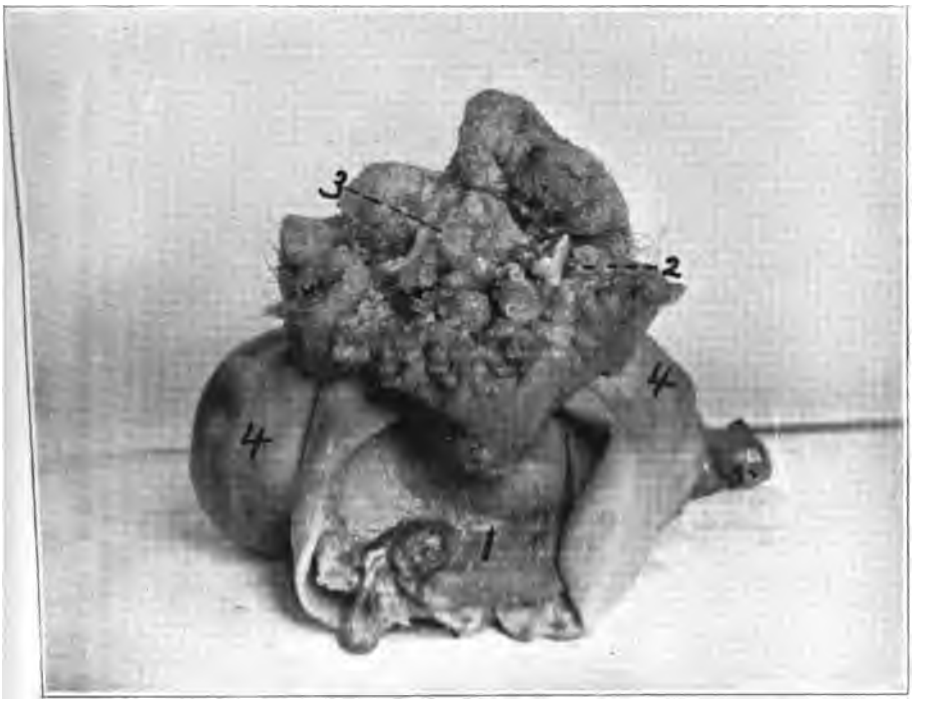


Fig. 3.

1. Skin covered with scattering hair.
2. Teeth imbedded in mass of fat and hair.
3. Bone resembling temporal bone.
4. Cysts filled with clear fluid.
5. Uterine end of tube.

utes. The stimulation, in addition to the salt solution administered on the table, was one-fifteenth grain of strychnia, several doses of spartine, and one-hundredth grain of atropia. Patient rallied quickly and made a good recovery.

The drain was removed on the third day and the sinus was found infected. This probably occurred from the cystic fluid

which escaped into the abdomen, as the contents of dermoids are usually infectious. The sinus has since closed and the patient is now, six weeks after operation, in good condition.

The three-lobe cyst of the left ovary contained a clear fluid in two lobes, and the third was filled with a thick fatty substance with hair mixed through it. It also contained a piece of skin covered with hair, a piece of bone resembling the temporal bone.

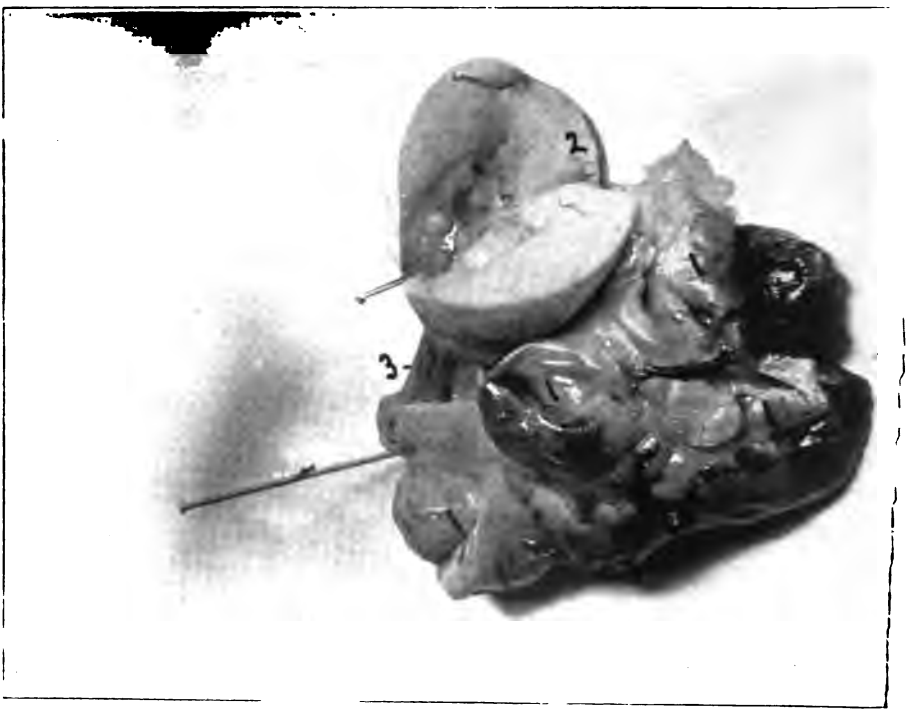


Fig. 4.

1. Number of small cysts containing fat and hair.
2. Solid body shaped like fœtal head.
3. Lock of hair one inch long.

and a rudimentary portion of the inferior maxillary containing four teeth.

The right ovary was divided into six cysts or sections, most of which contained a fatty substance and all of which contained some hair. One of them contained a solid body as large as a small walnut, shaped much like a foetal skull and covered with

fuzzy hair, with one small lock of hair about an inch long in one place. On cutting this mass open, it was found to contain lines of gray matter resembling brain tissue. These occurred in such a way as to resemble the ventricles of the brain.

Through the kindness of my friend, Mr. William Jack, I am able to show you some photographs which will illustrate some of the interesting points in the case.

From the study of this case, I conclude:

First—That these dermoids were congenital.

Second—That the unusual menstrual history was due to the fact that only a very small portion of ovarian tissue was present.

Third—That the cause of the tubal pregnancy was a contracted tube, due to a salpingitis and possibly a tubal abscess at the child-birth fifteen years before.

Fourth—That the destruction of the left tube was due to a twist in the pedicle which shut off the blood supply from the tumor and resulted in the attack of peritonitis seven years ago, the adhesions from which furnished the tumor with sufficient blood supply to prevent gangrene.

A CASE OF DOUBLE CONGENITAL TALIPES EQUINO-VARUS: PHELPS OPERATION.

BY WILL B. DAVIS, M. D., PUEBLO.

The accompanying cuts illustrate the case of Hattie Roberts, aged 8 years, better than pages of written matter could do.

The Phelps operation was performed on both feet November 28, 1898. It was necessary to chisel through the neck of the astragalus of each foot to secure thorough straightening.

The amount of soft tissues necessary to be cut was to me surprising—this being my first Phelps operation and the case an extreme one; but nothing less than the injunction of Dr. Phelps to cut every resisting thing to thorough over-straight-

ening sufficing, I proceeded to cut until both feet could be overstraightened without force.

I apprehended some loss of tissue on account of the necessary severing of so many nutrient vessels, and therefore was not surprised, on removing the plaster cast on the twenty-first day, to find the appearance of extensive sloughing; but such as there was proved after separation to be superficial. I contemplated skin grafting, but nature proved equal to the task; and although the healing process was long and tedious—some three months

Fig. 1.—Front view of case before operation.

Fig. 2.—A rear view of case before operation.

from time of operation until entirely repaired—I only maintained the members in proper position during the time by variously improvised plaster and other splints, with the aid of adhesive strips and many other devices which would be too tedious to mention.

There was not sufficient constitutional disturbance at any time after operation to indicate an interference with the first dressing before the expiration of the conventional time of three weeks.

At present writing—six months after operation—patient

can walk or run with simple ankle supports, carrying her feet at proper angle, and the soles of both feet rest well upon the floor when standing.

There is no ankylosis of the ankles whatever, though I fear they will always have to be supported to prevent the feet from turning out when the weight of the body is thrown upon them; for, as already suggested, pretty nearly all the internal resisting tendons and ligaments were severed. The contraction of the cicatrix may, however, overcome this.

Fig. 3.—After healing of wounds, patient sitting with feet resting on a stool.

Fig. 4.—After healing of wounds without support for feet.

REPORT OF A CURED CASE OF HYSTERO-EPILEPSY.

BY MINNIE C. T. LOVE, M. D., DENVER.

S. M., age 14, presented herself at W. C. T. U. Mission Dispensary in the latter part of August, 1897. Family history negative; mother and father living, large family of brothers and sisters all in good health. Patient's history: Chorea off and on from eighth to thirteenth year. About eighteen months before

her appearance at the dispensary she began having what her physicians had called epilepsy, the chorea disappearing. All kinds of medication had been tried by numerous physicians without relief. Her general appearance was one of perfect health: rosy cheeks, clear skin, and weight 130 pounds. Before and during the menstrual period the attacks were more frequent and severe, dysmenorrhoea was very great, lasting usually three days, and menstruation was prolonged, excessive and too frequent. Her mother told me that they hadn't much hopes that she could be cured, but she was getting so bad, in spite of medication, that they didn't know what to do. While we were talking, S. began acting queerly, and her mother, very much distressed, said she was having a fit. She began working her fingers together, and with a vacant stare in her eyes seemed to be looking for something on the floor. The facial muscles were much distorted and a look of distress was upon the face. She did not fall or foam at the mouth during this attack, although she often fell,—in fact, she could not be trusted upon the street alone, and her memory was getting so bad that she could not go to school. I was surprised after what I had been told to see so markedly an hysterical attack, and advised her to come to my office for electricity. She came September 1, 1897, and, as she had been under the care of a neurologist, I supposed eye strain had been eliminated. A gynaecologist had, after examination, pronounced the uterus normal, but had advised the removal of the ovaries. As I always hesitate to examine the pelvic viscera in so young a girl, I did not then do so. I applied the positive galvanic pole to her head, face, and eyes, the negative being applied to the cervical cord. I also used the static spark, both breeze and direct spark. After three or four applications in this manner, given at intervals of two and sometimes three days, she said that she could see with her right eye; she seemed better able to control herself and was not so frightened at the attacks. I was by this time sure that it was a case of hysteria. Not getting the hoped for results from electricity applied in the above mentioned manner, I examined her September 27. I found the uterus strongly flexed anteriorly and dislocated downwards; it was large, and all the pelvic viscera very sensitive. I advised dilatation, currettage,

and the use for a longer or shorter period of a uterine stem. Operated September 29, at St. Joseph's; found a large amount of granular debris in the cavity, and put in stem. September 30 she menstruated without pain or nervousness. October 3, slight nervous attack; in a week went home. She was practically free from the serious nervous attacks for about two months, during which time I kept up bi-weekly intra-uterine electricity, thereby securing the permanent patulous condition of the internal os. In December she went to Littleton one day, and while there suffered a more serious nervous attack than usual. The physician who was called in, Dr. McArthur, examined her eyes, and telephoned me that there was a great deal of astigmatism. Upon her coming home I immediately sent her to Dr. Chase, who will give you his report of the case.

After her eyes were fitted with glasses she came to see me, her mother and herself almost weeping for joy because she now had no menstrual pain or any more "fits." Her memory was improving so fast that she was going back to school. I of course was as happy over it as they were, and told her if she had any more trouble to come back. She has not been to see me, but a slight eye trouble a month ago caused her to see Dr. Chase again; he reports her in fine condition, weighing 170 pounds, and working hard.

I wish to emphasize the fact that she was hysterical and not an epileptic. Hysterical women have a hard time with the profession generally; and I am led to wonder how many of the cases of epilepsy reported as cured are epilepsy purely, and how many hysterical. In this case there was no aura, no prolonged loss of consciousness; when she was seemingly unconscious she knew what was being said and done much of the time. There was no biting of the tongue or foaming at the mouth. The eyes were rolled upward and the muscles of the mouth would twitch in a conscious way when she was discussed in her hearing. There was undoubtedly at times close resemblance to epilepsy, especially when she was roused out of a sound sleep at night to indulge in a fit, but careful differentiation must place the case as one of hysteria with epileptoid attacks, caused by two distinct sources of irritation, one in the pelvis and the other, the greater, in the eyes.

REPORT OF DR. JOHN CHASE.

Miss S. M. was referred to me on December 1, 1897, by Dr. Love. I found the eyes in the following condition:

R. E. Vision $= {}^{20}/_{40}$.

L. E. Vision $= {}^{20}/_{120}$.

Eye muscles nearly normal. She had very little headache and little or no blurred vision after using her eyes. In addition to the convulsions reported by Dr. Love, there was present a constant twitching of the lids which was increased by use of eyes. There being considerable spasm of accommodation, the eye was kept under atropine for four days before the final test was made. After the third or fourth dose of atropine the twitching of lids nearly ceased. After the second day's use of the drug, the patient slept more quietly than she had for weeks. After test by trial case and skiascopy the following glasses were prescribed, in full correction of the refraction:

R. E.—0.50 spher = —0.50 cyl. ax. 180° Vision $= {}^{20}/_{20}$.

L. E.—4.50 cyl. ax. 180° Vision $= {}^{20}/_{30}$.

August 29, 1898. Patient reports complete recovery from nervous symptoms, and says she can use her eyes freely.

April, 1899. Reports that for two or three days there has been a return of the twitching of the lids. There was considerable hyperaemia of the lids. After two days' use of cocaine, sulphate of copper crystal and large doses of suggestion, the nervous symptoms disappeared and the recovery was complete.

A CASE OF SEPTICAEMIA TREATED WITH NORMAL SALT SOLUTION.

BY CARROLL E. EDSON, A. M., M. D., DENVER

During the past ten years increasing attention has been directed to the intravascular employment of normal salt solution in cases other than of hemorrhage. Since 1896 especially has its use been tried in cases of general sepsis of varying origin. The considerable and exceedingly interesting literature upon the sub-

ject was well summarized in an article by Dr. T. F. Reilly in the Medical Record of November 12, 1898.

I report the following case as a clinical contribution to the increasing number of successful cases, that I may help, in whatever small measure, call attention to this ready and simple means of combatting what has else been too often a prolonged and hopeless struggle. I regret the absence of full bacteriological and blood examinations. I should not ask your attention to an imperfect protocol were it not for the striking and suggestive lesson which the case affords:

Case—Mr. M., 26, single, an electrical engineer, had been under my close observation for a year, during which time he had two typical attacks of follicular tonsilitis. The family and previous personal history have no bearing upon the illness under consideration. In 1896-'97 he had a severe and rather prolonged fever—which may have been typhoid, although reported not to have been. His habits and conduct of life had been exemplary and his health always good. During the spring of 1898 he was much overworked, and, from the first of May until his illness in November, had in addition to overwork great business responsibility and anxiety. He was much run down, and sleeping poorly.

Early in November he suffered from a moderately severe attack of the infectious angina then so prevalent. The throat was intensely sore and there was considerable glandular swelling in the neck. The tonsils were not more involved than the rest of the throat. There was no follicular exudation. There was no bacteriological examination made, but the case was similar in every way to others during the epidemic, and was probably due to a streptococcus infection. Recovery was slow, with great prostration. He returned to work too soon, against advice. During the week at the office he complained of general muscular soreness and weakness. On November 24 his throat, which had been only moderately uncomfortable, became very sore again and there was great backache, headache, high fever. During the next two days the attack ran a course similar to the first, save that there was more general pain, tending to localize itself in the joints. On this account treatment by salicylates and alkalies

was followed, with anodynes and opiates. No relief was obtained. The muscular and joint pains became worse, although there was little or no swelling. There was great difficulty in securing sleep. The temperature remained high, and it became evident that the illness would be prolonged.

On the 28th the condition became rapidly worse. While the temperature and pulse remained where they had been for several days, in the neighborhood of 101° and 110 beats per minute, the respirations rose rapidly to 35 and later to 40. There was no conscious dyspnoea, no local pleuritic pain to be distinguished from the great muscular pain everywhere present. Careful examination disclosed nothing more than a small area in the middle of the upper lobe of the right lung with harsh and distantly exaggerated breathing, and very slightly heightened percussion note. The heart was negative, and it may here be remarked that daily examinations never revealed any evidences of endo- or pericardial lesion.

For the next three days there was much intestinal distension, with a good deal of tenderness, which was not localized. There was some vomiting and troublesome belching of gas. The bowels were finally opened by calomel, salines and high enemata, and the gaseous distension relieved by repeated enemata of asafoetida. During the rest of the illness there was fortunately no disturbance from the gastro-enteric tract, and, with the exception of a few days during which there was slight febrile albuminuria, the urine remained normal.

The area of suspicious import in the lung did not increase, and there was no further development of any actual pneumonic process. There was lingering and rather shifting evidence of congestion over small patches in the upper right lung for a week or more. The respirations, however, remained continuously rapid and rather shallow.

The pains rapidly became absolutely crippling. The knees, ankles, shoulders, elbows and hands were successively and irregularly invaded. There was only very moderate swelling, which appeared to be not in the joints so much as an oedema in the tissues about the joints. Over the backs of the hands this was especially noticed. There was at times a very faint blush over

small areas, but never noticeable unless looked for. There was also very great tenderness over the muscles. Indeed, it was difficult at times to say whether the pain which made it almost impossible to move or care for the patient was caused in the joints so much as by pressure upon the muscular tissue. The best, though only slight, relief obtained was from painting the joints with 25% ichthyol and wrapping them in cotton with hot water bags upon the outside.

There was almost absolute insomnia, and the few moments' rest obtained was marked by incessant delirious conduct of business affairs. For a while trional seemed to give the best results, but codeine, chloral, morphine, laudanum, bromides, had little effect in quieting the increasing restlessness, and none produced any quiet sleep.

The pains in the joints and limbs would be slightly relieved but soon returned. The condition on the 5th of December was most desperate. The temperature and other curves upon the chart do not convey any idea of the illness. There was marked emaciation, and a frightened, ashy look of distress which can hardly be described. The decubitus was one of complete muscular relaxation, the limbs helpless from pain which caused the man to moan if he saw any one approach the bed. The temperature remained steadily between 101° and 102° F., with an alternation of higher fever every other day. The pulse, varying from 110 to 118, was weak, small and compressible, but regular. The respirations remained constantly rapid, about 35, but from time to time there were periods of great distress in breathing, unexplained by any discoverable cause. There was very great restlessness amounting to jactitation much of the time, insomnia and delirium at night, and by day a curious mental state of apparently clear ratiocination which, however, was not real. Close watching showed the frequent blurring of the mental processes, and the patient has no recollection whatever of about ten days' events.

There were no rigors, or marked fluctuations in temperature, but the patient was frequently chilly. Considerable soothing followed hot alcoholic baths.

Despite nourishment, which was well taken, and abundant stimulation—sulphate of strychnia, gr. $^1/_{30}$ subcutaneously every four hours, and five drachms of whisky every two hours—the patient was evidently fast succumbing to the septic invasion. The injection of normal salt solution into the tissues seemed to offer slight hope, and its use was approved by Dr. W. H. Bergtold and Dr. C. A. Powers, who saw the case with me. At four o'clock on the afternoon of December 5, Dr. Powers injected sixteen ounces (℥xvi) of hot sterilized normal salt solution into the subcutaneous tissues about the breast.

Following the injection there was perhaps a slight improvement in the restlessness and there were several quiet naps of from ten to forty minutes. There was an abundant and considerably increased flow of urine in the next twelve hours—nearly double the amount of the corresponding length of time before. Between 12 and 2 a. m. there was a period of very great restlessness and excitement during which time it was difficult to keep him in bed.

The morning of the 6th there was no especial improvement in the temperature, pulse or respiration, but the pain was a little less and the general condition seemed to warrant a continuance of the treatment. At 8 a. m. twenty-six ounces were injected slowly into the right median cephalic vein. The injection caused great distress—pulse of 120 and respiration of 40, with very great excitement for a short time and profuse perspiration. Two hours later there was a sharp rigor lasting twenty minutes, the temperature rising from 100.6 to 103.8. Following this the temperature gradually fell to 99.8 at 4 p. m., the lowest since the beginning of the illness. During the day the patient was much quieter than he had been and there was no note of pain. The legs and arms were much less tender and the hands were used a little. At 8, the temperature rising to 100.8, a third injection of eighteen ounces was made, this time under the pectoral muscles, as there seemed much less disturbance and equally good results from intracellular injection. Following this there was no chill and only moderate sweating. A good deal of quiet sleep, with only light whispering delirium, was had during the night. The 7th there was much relief from pain in the morning.

but during the day the restlessness, delirium and pain returned and at 4 p. m., the temperature, pulse and respiration all being much higher than for two days, a fourth injection of fourteen ounces was given. All the symptoms at once abated—the pain and tenderness first. The general expression of improvement was more marked than the chart even—the pulse rate became much lower and the quality better. On the 9th there was a rise of temperature, which led to the consideration of further saline infusion, but this was postponed for signs of increasing pain, which did not develop. A similar rise on the 13th also proved a false alarm.

The subsequent history has nothing of general interest. The mild delirium lasted a long time, as did moderate fever and great weakness. The emaciation was extreme and the patient absolutely unable to help himself—simply from muscular weakness. Convalescence was necessarily slow after such an illness, but was uninterrupted and complete.

The interesting features of this case were:

First, the nature and location of the septic process. While I lack all bacteriological proof, I am inclined to think it was due to the streptococcus, for the following reasons: It followed directly upon the recrudescence of an infective angina which was clinically the counterpart of others in which the streptococcus was demonstrated, and the absence of any suppurative process. A general typhoid infection was ruled out by the clinical picture of the illness—the absence of Widal's reaction and the probable typhoid character of illness two years before. Nor was the picture one of a pneumococcus infection in the lungs. There was no consolidation nor characteristic expectoration. That the focus of the infection starting from the throat became secondarily located in the lungs, I am inclined to believe from the coincident appearance of the profound sepsis, the very rapid breathing and the signs so characteristic of moderate congestion. The shifting nature of these signs were also points in favor of a streptococcus invasion. There may have been some localization in the joints, but I am of the opinion that the pains were rather of a secondary irritation from absorbed toxins. This can, of course, be only conjecture.

Secondly, the very noticeable relief obtained by the use of the saline solution. The lessening and cessation of pain, the quieting and clearing effect upon the brain, and the improvement in the pulse and whole general appearance were very striking. That this was not a chance coincidence seems proved by its immediately following four separate injections, the symptoms having returned after the lapse of a number of hours. Certainly up to the time of the infusion the patient was steadily and rapidly failing; from that time began his recovery.

Lastly, the ease with which large amounts of salt solution can be injected under the skin, if the fluid be allowed to run in slowly with gentle massage, and the quickness with which it was absorbed. So far as I could see in this case the relief from the subcutaneous injections was quite as marked as from the intravenous infusion, while the disturbance appeared less. Other observers have reported excitement following even subcutaneous injection. The sweating and free urination are noticeable in all instances. Should I be so unfortunate as to see another so severe a case I would resort early to the use of repeated saline infusions, which can certainly, in the light of our present knowledge, do no harm, and which offer such hopeful results.

Permit me, in closing, to call attention to the way in which saline infusion probably accomplishes its good results. It is not, as was at first supposed and stated in the earlier literature on the subject, due to an actual washing out of the toxines from the tissues; because the amount injected at any one time, if into the vascular system, does not reach them directly; or if into the subcutaneous tissues it can not permeate the whole body, the toxines being infiltrated through all the tissues. Careful observation and experimentation has shown, first, that the injection of hot salt solution, whether it be intravenous, subcutaneous or rectal (the only difference of the three being the rapidity of absorption) tends to increase the arterial tension and the volume of the blood; it fills the arteries, it strengthens the force of the cardiac beat, and slows the pulse, as it certainly did in the case which I have just reported. The increased tension of the arterial flow increases the excretion of urine, the amount being very marked in many reported careful observations. The dilution of

the toxines—not an immediate washing out, but the volume of blood being increased and the amount of toxine in any given amount of blood thereby lessened—gives the tissues a chance to meet them. The dose of poison sent to the brain or to the heart is less, more diluted, and enables the tissues to resist and carry it off by the various methods of elimination, notably the increased urination and the increased perspiration.

DISCUSSION.

Dr. C. A. Powers—Dr. Edson was good enough to ask me to see this interesting and very urgent case with him. His clinical history has been so clear and distinct that there is nothing more to be said. I think there can be no question that this was a case of true septicaemia. It impressed me so clinically, in every way. Further, I think there is no question but what the infusion of the saline solution was directly the cause of the improvement, for improvement followed it in each instance. I think it is directly responsible for the saving of the man's life, and that is certainly saying a great deal. In each instance the improvement was immediate. I think with Dr. Edson that the infusion under the pectoral fascia is more simple, more easy, and as efficient as the intra-venous.

May I be allowed one or two words as to the technique of the infusion? One need not say at this day that everything must be absolutely sterile. Here in Denver it is not difficult for us to get a sterile and properly made salt solution. We can get it at one of the hospitals—a solution which has been sterilized by the fractional method; in this instance we simply got a large flask of the solution and heated it each time to the proper temperature. If one has to make the salt solution in a hurry, the proper proportion is reached by putting a heaping teaspoonful of common salt to the quart of sterile water. This may be infused at a temperature of 110 or 120. Roughly speaking, the heat of the solution may be about that which one's hand well bears. One can test it roughly himself—one does not need a thermometer. The amounts used in Dr. Edson's case were about the average quantities which should be used; perhaps a trifle under,

certainly not over. These patients will bear *large* amounts. The tissues take up the salt solution very rapidly, and it is eliminated very quickly by the kidneys and by the skin. As Dr. Edson has said, increase in the flow of urine and profuse perspiration followed in each instance the infusion. I think that Dr. Edson may well be congratulated on the recovery of such a complicated and desperate case.

VERTIGO.

BY H. T. PERSHING, M. D., DENVER.

The patient has a false sense of motion of his own body or of the objects about him. The sensation may be so strong as to cause actual motion of the body in the same direction.

I. There is coarse organic disease of the brain or its membranes, generally shown by headache and vomiting (not dependent on the vertigo), together with such symptoms as hemiplegia; paralysis of ocular muscles, face, tongue or one side of larynx; inequality of pupils or failure of light reaction; optic neuritis or optic atrophy; typical ankle clonus; Jacksonian epilepsy; coincident mental impairment, etc. The localizing symptoms generally indicate the cerebellum, pons or quadrigeminum as the seat of lesion.

Vertigo of Organic Intracranial Disease: special diagnosis to be made as in cases of hemiplegia, optic neuritis, headache, etc.

II. There is degenerative disease of the central nervous system, shown by its very slow onset and the presence of such symptoms as ataxia, intention tremor, ocular paralysis, nystagmus, optic atrophy, Argyll-Robertson pupil, loss or great exaggeration of knee jerks, slight urinary difficulty, stumbling or scanning speech and characteristic mental impairment.

A. The gait and station are ataxic, especially when the eyes are closed, and the knee jerks are absent. A history of lightning pains in the legs is common, also of loss of virility.

slight urinary difficulty and ptosis or diplopia. Argyll-Robertson pupil in most cases. *Tabes.*

B. Intention tremor, with nystagmus or scanning speech, is associated with various signs of scattered lesions, such as isolated paralyses, contraction of the visual fields with impairment of color sense, loss of smell, nervous deafness, etc.

Disseminated Sclerosis.

C. Failure of judgment and memory, often combined with monstrous and unsystematized delusions of grandeur, accompanies signs of organic diseases, among which inequality of pupils and stumbling speech are common.

Paretic Dementia.

III. Positive signs of organic disease of the brain or membranes absent, but there is evidence that the cerebral vessels are diseased.

A. The patient is past forty. The arteries are atheromatous and pulse hard. Vertigo often accompanied by throbbing headache which is increased by exertion or excitement. Heart often hypertrophied, and some albumen may be found in the urine. *Arterio-sclerosis.*

B. Age and general condition exclude senile degeneration. Nocturnal headache and insomnia generally present. History or physical condition or mental deterioration without other assignable cause give evidence of syphilis.

Syphilitic Endarteritis.

IV. There is no organic disease of brain, membranes or vessels.

A. The vertigo follows a blow on the head, and may persist after all other symptoms have disappeared.

Concussion.

B. The vertigo follows rotary, swinging or vertical motion of the body, as in sea-sickness. *Mechanical Vertigo.*

C. There is a toxic cause, as in cases of over-consumption of alcohol, tobacco, caffein or other drugs, or of auto-intoxication as by uric acid, urea or ptomaines. *Toxic Vertigo.*

D. Vertigo occurs in paroxysms, in association with tinnitus and deafness, which are shown to be nervous by impair-

ment of bone conduction and limitation of the auditory field for high notes. Lesions of the middle or external ear may coexist, and in some cases they are the primary cause of the labyrinthine disease. Paroxysms are sometimes excited by coughing, sneezing, a loud noise, indigestion or any depressing influence, and may be severe enough to hurl the patient to the ground. Between paroxysms vertigo may be entirely absent or present in the slightest degree, but deafness and usually some tinnitus persist. Nystagmus, diplopia, vomiting and severe prostration may be secondary consequences of an attack. A disease of adult life, twice as frequent among men as among women.

Labyrinthine Vertigo (including Ménière's Disease). Subacute and chronic inflammation and degeneration due to cold, gout, syphilis or senile changes are the common conditions; hemorrhage and acute inflammation are very rare.

E. Weakness of one or more ocular muscles causes an erroneous projection of the visual field. Vertigo disappears on closing the eyes or on restoration of the muscle balance. Usually transient owing to the re-education of the sensory centers involved. Comparatively rare. *Ocular Vertigo.*

F. Vertigo is preceded by indigestion and disappears when the indigestion is cured. Organic disease of the labyrinth excluded. *Gastric Vertigo.*

G. Vertigo is associated with disease of the nose or adjacent sinuses and increases or diminishes with it, sometimes being relieved by an application of cocaine. The labyrinth is not organically diseased, but is probably disturbed owing to an intimate relation between the nasal and labyrinthine vessels. Very rare. *Nasal Vertigo.*

H. The cerebral circulation is disturbed.

1. Vertigo associated with throbbing in the head, perhaps with flushing of the face and injection of the conjunctivæ. Increased by coughing, sneezing, straining or lowering head. *Active Hyperæmia.*

2. Associated with dull, heavy feeling in head. Return of venous blood obstructed by mitral regurgitation, tumor of the neck, constriction or other cause. *Passive Hyperæmia.*

3. Heart action is weak, or impoverishment of blood is shown by pallor of skin and mucous membranes, faintness, low percentage of hæmoglobin or paucity of red corpuscles. *Cerebral Anæmia.*

I. Vertigo occurs as part of a periodic nervous attack, disease of the labyrinth being excluded.

1. The vertigo occurs as the aura of an epileptic convulsion or, together with a brief interruption of consciousness, constitutes an attack of petit mal. *Epileptic Vertigo.*

2. The vertigo is part of periodic attacks in which unilateral headache, nausea, intolerance of light and noise, and partial darkening of the visual or subjective perception of light are common. Rarely it may constitute the whole of an attack. *Migrainous Vertigo.*

3. The earlier attacks have an emotional cause, and afterwards may occur or be suppressed in consequence of an emotional change or a suggestion. Various signs of hysteria may be present. Hysterical deafness and tinnitus may be so associated as to closely simulate labyrinthine disease. *Hysterical Vertigo.*

J. The patient's nervous energy has been exhausted, especially by prolonged worry with or without over-work. He can generally exert normal bodily and mental powers for a short time, but is soon fatigued and is more or less irritable. Unreasonable fears are common. Painful or tender spots in the head or along the spine (found to be of shifting location if accurately marked) are very common. Other morbid sensations in the head are often described as queer rather than painful, such as tightness or looseness of the scalp, heaviness, lightness, emptiness or dullness of the head, etc. *Neurasthenia.*

K. No sufficient cause can be found.

"Essential Vertigo."

Most probably a symptom of beginning disease of the labyrinth, or of an undetected accumulation of uric acid.

DISCUSSION.

Dr. S. D. Hopkins—I am very much interested in Dr. Pershing's paper and can add nothing more to the causes of vertigo; but I would like to cite a case illustrating how intense the vertigo may become in diseases of the nervous system. The case is a man 42 years of age, who came under my care about a week ago, suffering from locomotor ataxia for the last ten years—he has suffered from slight vertigo for the last three. About a week ago he suddenly became very dizzy, and noticed that he was unable to swallow. This condition has existed to the present time. He is able to talk. He had slight weakness of the right side of the body at first; then it changed to the left side, and later the right side of the body became weak again. He had a marked heart lesion—mitral regurgitation—and a very weak pulse. I made the diagnosis of embolism of the vertebral arteries. This patient at the present time, owing to the occlusion of the vessel and the locomotor ataxia, is unable to sit up in bed or stand on account of the severe vertigo produced.

In regard to the cases where no cause can be found for the vertigo I fully agree wih Dr. Pershing that they are usually due to uric acid diathesis.

Dr. E. Jackson—As to ocular vertigo, as a long continued or frequently recurring condition depending on a lack of balance of the ocular muscles, I think, with Dr. Pershing, it is rare. But it rather frequently happens in cases of progressive palsies of the ocular muscles that there is a history given of increasing vertigo of several days' duration before any distinct ocular symptoms were recognized. The patient has had this vertigo several days and presently begins to see double, and then thinks about trouble with his eyes. In a good many cases of ocular palsies seen early you will find no symptoms complained of except the vertigo. This should be borne in mind in the diagnosis of any case that gives a history of recent vertigo. It would not apply probably to old cases. Several cases which I have seen of vertigo in connection with tabes have appeared to be real cases of defect in the balance of the ocular muscles, or paresis of one or more of these muscles such as often occurs in connection with that disease.

Dr. E. Stuver—A number of years ago I had a very interesting case of vertigo in which the vertiginous symptoms came on when the patient assumed the recumbent posture. He was all right enough as long as he was up and around and looking around in an ordinary way. As soon as he lay down on the bed, however, everything appeared to turn around. He also said that when he raised his eyes at an angle in order to look up towards the sky, or at an angle of much above the ordinary horizontal direction, the vertigo would also come on. I could find no indications of serious organic lesion, and attributed it to a toxemia; and the fact that the patient recovered under an eliminative treatment, and is now living here in Denver, would carry out that supposition.

Dr. Melville Black—My experience has been that ocular vertigo differs from almost every other kind of vertigo, and if that is taken into consideration in making the diagnosis of the cause of a given case of vertigo I think it will oftentimes assist in removing some of the perplexities. In ocular vertigo we do not have the rotary movements, nor the tendency to turn in one particular direction, but rather a state of confusion; and if you inquire closely into the symptoms of vertigo due to some ocular disturbance, I think it will be almost invariably found that the patient will confess that it is more of a confusion of things causing him to be somewhat vertiginous rather than a reeling vertigo. By this difference oftentimes a diagnosis can be made excluding other causes, especially the ear, cerebellum, etc., in the production of the vertigo.

Dr. H. T. Pershing—I appreciate the careful discussion of my paper. The case that Dr. Jackson has mentioned, of vertigo associated with palsy of the ocular muscles, would be included in my second group, that is, vertigo due to chronic degeneration of the central nervous system. At the same time I have no doubt that the vertigo is largely produced by the weakness of the ocular muscles with the loss of muscle balance. But in such cases, for clinical purposes, it is so much more important to recognize degenerative disease than the special condition of the ocular muscles that I have included it under the head of vertigo due to degenerative disease. I am very glad indeed to get the points made by Drs. Jackson and Black.

In regard to Dr. Stuver's case I should suspect that it was not toxic vertigo, because in it the vertigo ought to be greater when a man is up and on his feet; the fact that it came on only when lying down would make me rather suspicious that it was hysterical.

The case cited by Dr. Hopkins is one of very great interest. In that case there were two causes of vertigo, first, tabes, causing it in the usual way of nervous degeneration, and then the vascular lesion.

Dr. E. Stuver—I wish merely to state that this was a very level-headed, sensible man and not given to hysterical manifestations at all; and the other peculiar feature of the case was the vertigo coming on when the eyes were raised above the ordinary horizontal level.

FUNCTIONAL AFFECTIONS OF JOINTS.

BY GEORGE B. PACKARD, M. D., DENVER.

Any one who sees much joint disease has often to distinguish between a functional affection of a joint or spine and an organic or inflammatory condition. The frequency with which we meet these cases, and the difficulties connected therewith, is my apology for bringing this subject before you.

While this pseudo-arthritis may be induced by an exhausted nervous system, and occurs frequently in persons of an emotional temperament, usually in women, yet it is seen sometimes in persons of an opposite temperament and from various causes. Therefore, I think it should not be considered hysterical in all cases, but rather, many times, an indication of some weakness about the joint or nervous system.

This functional or nervous disorder may affect the spine, hip, knee, ankle, and occasionally other joints. While this condition may not have any pathological basis that we can describe, there is undoubtedly in most of these cases a slight peripheral irritation, which would not give rise to joint symptoms except for instability of the nervous system. This irritation serves to

concentrate the attention upon the part affected, and is an important factor in prolonging the symptoms.

These cases should be very carefully studied: we should consider the temperament of our patients, their history, their early training, and their present surroundings; for they simulate so closely organic disease that it is sometimes with the greatest difficulty that a correct diagnosis can be made. The importance of distinguishing these functional affections from the inflammatory condition should be particularly emphasized because the treatment is diametrically opposite—in one case rest, in the other activity.

In considering the etiology of these cases we frequently find an exciting cause of some slight traumatism, the effects of which would soon disappear were it not for the emotional temperament and hypersensitiveness of the nervous system; the attention once being concentrated upon the joint, it is very difficult to overcome the sensation of pain and disability. It no doubt occurs more often in young girls about the time of puberty, and in women at the time of the menopause; but it is not by any means confined to these periods nor to the feminine sex. Dr. Bradford says: "Another fact which can not be too strongly stated is that functional symptoms may be present when there is no evidence of mimicry or deceit, and sometimes when there is no evidence of exaggeration or emotional excitement." Another exciting cause that may be mentioned as bringing about this peripheral irritation is muscular weakness. The latter may be caused by chronic joint disease, especially when immobilization and bandaging have been unduly prolonged, or from any other cause that interferes with the proper mechanical use of the joint.

This shows the importance of passive exercise and massage as soon as possible after the joint inflammation has ended. There is undoubtedly great danger of doing harm to a joint already cured by prolonged fixation, bandaging and rest. The following case illustrates this point: A healthy young girl fifteen years old, well developed but rather neurotic, had suffered from synovitis of the knee joint from which she apparently recovered a few years before coming under my care. When first seen by me she complained of slight muscular weakness, which allowed some

lateral mobility of the joint. This was sufficient, however, to concentrate the attention of patient and friends upon the joint. The result of this constant apprehension was an exaggerated description of the symptoms. Although I was in doubt about the actual condition of the joint, I advised absolute rest to the part. The patient was seen a little later by Dr. L. A. Sayre, who advised the same treatment to be continued. There was, however, no improvement, and she continued to complain of great pain, tenderness, and all subjective symptoms of joint disease until the opposite course was pursued, of massage, passive motion and regulated exercise. Bearing on this point Dr. Lovett remarks: "If any joint injury is severe enough to require fixation, this fixation should be complete enough to be efficient while it lasts, and should be discontinued as soon as the inflammation is over. If the joint injury is not severe enough to require fixation, massage should find an early place in the treatment. In joint injuries half-way measures have very little to commend them, and are responsible for many cases of local muscular atrophy lasting indefinitely."

This condition is present much more frequently than is generally supposed. Gibney says: "I have studied many cases that lay on the border line of neurology and orthopedy. Many instances of apparently formidable joint affections I could trace to a neural origin, and I obtained speedy cures with some knowledge of the nervous system at hand." Brodie makes the following statement which Esmarch endorses: "I do not hesitate to declare that among the higher classes of society, at least four-fifths of the female patients who are commonly supposed to labor under disease of the joints, labor under hysteria and nothing else." This is undoubtedly an exaggerated statement, yet it may be well to bear it in mind in considering these cases. Shaffer says: "My own experience convinces me that neuro-mimetic joints and spines, and more particularly the latter, are very frequent both in the upper and lower classes." He also says: "The cause of these erratic manifestations of the nervous system is very obscure. That it is not mimicry in the literal sense of the word, is proven by the fact that the majority of my own cases have never had the opportunity to become acquainted with the symptoms of the disease itself."

These cases, not always being recognized as such, afford many opportunities for remarkable "cures" by charlatans. Presenting, as they do, many if not all of the subjective symptoms of organic disease, the recovery from lameness seems almost miraculous to the uninitiated.

In calling attention to the symptoms of these functional affections, it is always well to bear in mind that while a patient may give a history quite in accordance with organic joint disease, the subjective symptoms are greatly exaggerated and out of proportion to the objective signs. Superficial tenderness is especially noticeable in these cases, particularly in the knee, ankle and spine, and as a rule it is unaccompanied by heat, which is an important factor; for we usually look for increase of surface temperature where pain and tenderness are such prominent symptoms. In the few cases where heat is present, it is probably due to superficial hyperaemia; and even in these cases it is not constant,—it is more apt to be reduced.

Another symptom that is frequently present and apt to be very misleading is creaking of the joint, especially in the knee. We must bear in mind that if creaking or grating were present in organic disease, sufficient local irritation would exist to induce marked muscular spasm; and the trouble would be so far advanced that it would be impossible to detect this symptom except by use of an anaesthetic. These inconsistencies of symptoms are always suggestive of functional trouble. Muscular spasm is not as constant as in organic disease, but varies at different times and can be overcome temporarily if the patient's attention can be diverted. It will, however, produce the characteristic deformities of joint inflammation. The knee may or may not be flexed, the foot may be distorted, and the hip may be flexed and adducted or remain straight. We do not see the marked reflex muscular atrophy, but we must expect some atrophy from disuse if the trouble has existed for any length of time. Lameness is always present, and pain is more marked and much more difficult to relieve than in true disease.

When the spine is involved the pain is referred to the base of the neck, the end of the spine, or between the shoulders. When this condition is present in the hip the pain is located at the

hip, and not in the knee as is frequently seen in hip disease. In the knee and ankle it is greatly exaggerated upon the slightest motion. It is frequently necessary to keep the patient under observation for a time, and to make several examinations under different circumstances, before a positive diagnosis can be made. The following case, which came under my care while house-surgeon in the New York Orthopedic Hospital, illustrates how closely hip joint disease may be simulated; and in this instance the hysterical element predominates:

Miss E. O., aged 20, applied for treatment September, 1885. Family history good with the exception of one sister who had hip disease. Patient had always been a delicate girl, and had suffered at times from hysterical convulsions and other manifestations of hysteria. A few months before applying for treatment she received slight injuries to the hip, which were followed by lameness. On admission following history was recorded: Patient pale and with anxious countenance; limps very badly. Hyperaesthesia of lumbar region. Vertebral column very flexible. Excruciating pain and apparent reflex contraction on movement of joint. Flexion and adduction of thigh, flattening of natis, gluteo-femoral crease lower and larger. Traction relieves pain. Patient entered ward, and weight and pulley applied. Although symptoms were urgent, very little relief was obtained from the extension. After several days' observation it was apparent that the symptoms were neurotic and hysterical. Extension was removed. Patient was ordered up and exercise advised, and in due time patient made a good recovery.

These symptoms developed in a girl of fair health who had been the personal attendant of her afflicted sister, suffering from hip disease; no doubt the dread of the disease was sufficient to develop the symptoms in her sensitive condition. If the mistake is made of immobilizing the joint, in cases of this kind, the result is sometimes very serious. This interference with the normal functions of the part will cause great disability and a false anchylosis, which may give a great deal of trouble. Functional trouble, if left to itself, may remain unchanged, and simply from prolonged disuse the joint will be in-

jured; or in some cases there may be a gradual improvement if the general health is improved. The longer the condition has existed the more difficult it is to overcome.

In treating these cases the general condition of the patient must be thoroughly looked after. General tonics and outdoor life are important. The local condition will also require attention in most cases. As soon as we feel sure of our diagnosis we can assume the management of these cases with positive assurance of improvement. We should have a definite plan of treatment to carry out, and not be influenced to any degree by the opinions of the patient.

It is generally necessary to overcome local pain and disability. When the spine is the seat of trouble the patient will suffer so much from pain and weakness that I have found it necessary in some cases to use a light, flexible support until the patient becomes stronger—not to fix the spine, but rather to assist the muscles to support the spinal column. It is also advisable to use cold sponging, friction, massage and light gymnastic exercises. The jacket or any immobilizing apparatus will prove harmful, as they necessarily weaken the muscular support and thereby increase the disability.

In functional affections of the knee, hip and ankle, it is also necessary in some cases to temporarily protect the joints until the circulation and muscular support has been improved by massage, electricity and passive motion. It may be necessary in some cases to wear a light support, which prevents the weakened muscles and ligaments from becoming more relaxed; but this must not interfere with the normal functions of the joint, such as motion and weight-bearing.

Just how long these joints will require a certain amount of protection, and just how rapidly the active exercises can be increased, is a question of judgment in each individual case.

In considering this subject I have not attempted to write an exhaustive paper, but have simply endeavored to call attention to a few practical points that may be of some help in the way of diagnosis and treatment.

DISCUSSION.

Dr. J. T. Eskridge—The subject is an intensely interesting one, especially for the neurologist as well as the surgeon. Rarely should these cases be studied alone by the surgeon or by the neurologist. They come eminently into both specialties. I have found that the greater mistakes are made in confounding organic trouble for functional trouble; especially is this so in the joints of the spine. I can recall now case after case that has been diagnosticated by the physician as functional disturbance of the spine, and patient being allowed to go around and the physician insisting that he or she should go around, and a year or so afterwards organic spinal trouble developed, with deviation of the spinal processes and all the evidence of involvement of the soft tissues of the spinal canal.

I recently had a case sent to me from the southwestern part of this state in the person of a woman, about 20 years of age, who formerly had been a school teacher, and who had taken to millinery work because she ceased to be able to get around. She had been treated, so this physician wrote me, by a number of physicians, most of them in very good standing, and she presented so many symptoms of organic trouble of the hip and of the sacro-iliac joint that they were not willing to say that there was not organic trouble. I examined her carefully in my office and I felt positive in excluding any nervous lesion. I sent her up to St. Luke's Hospital and asked Dr. Packard and Dr. Rogers to see her with me, and they assured me that there was no bone trouble. She had been unable to walk for two or three years. The results of the treatment were that in three days she walked from St. Luke's Hospital to my office, and in less than a week she was able to walk from beyond St. Joseph's Hospital to my office without experiencing any difficulty. She was simply "hipped" in her hip. She lacked confidence. There was no trouble there. I had a gynecologist examine her, Dr. Jayne, to find out whether there was any intra-pelvic trouble, and he assured me there was not. And after paying at least four consultation fees she determined if there was no trouble she would overcome it, and, as I say, her consulting physicians cured her simply

by assuring her there was no trouble. She has recovered and is perfectly free from her trouble. Now this only shows what may be done by constantly keeping the mind on one part of the organization, be it the hip or any joint, or what not.

I would like to add a few other points in the diagnosis between functional and organic joint disease. One is in the knee jerk. The knee jerk is almost invariably increased in the leg corresponding with the organic trouble. The knee jerk is increased in both legs in functional trouble, but about equally on the two sides.

Another point—and I think this was brought out by Dr. Packard—is that by persistent and prolonged examination the apparently shortened muscles or the contracted muscles will give way, and you will find that you can put the limb in any position without giving the patient pain. She feels that the physicians are trying to determine what the trouble is, she gives her whole attention to what the physicians are doing, and the rigidity relaxes by her attention being distracted from her supposed joint trouble. As it was in this case with Dr. Packard and Dr. Rogers, the muscles, when they began the examination, were intensely rigid and held the leg in one position, but they relaxed and the surgeons were able to put the leg in every possible position in which it normally can be put.

A third diagnostic point in the differential diagnosis of functional and organic hip disease is that in organic disease of the joint only the extensor muscle atrophies; in atrophy from disuse both flexors and extensors atrophy.

I shall have to differ with Dr. Packard in some of his methods in these cases. I do not believe that in the simply functional (I mean cases that are not organic, but are simply functional diseases of the joint) it is necessary to give them artificial support. I have succeeded best and most quickly in the treatment of those cases simply by insisting that they walk every day; I have a nurse to see that they do walk, and after two or three days' practice I have them walk out in different portions of the hospital. I do not believe these cases are very curable if left at home. They are much better treated at the hospital, where you have a nurse to look after them. In other

words, treat them as you would treat a hard case of hysteria. They are profoundly impressed with their trouble. It is as real to them as though there were organic trouble, and by this method I have not been bothered more than a few weeks at most in the treatment or in the cure of any of these functional diseases of the joints.

EXTRA-DURAL SPINAL MENINGEAL HEMORRHAGE; WITH REPORT OF A CASE.

BY S. D. HOPKINS, M. D., DENVER.

The patient, J. M., was admitted to St. Joseph's Hospital June 16, 1898.

His family history is negative.

Previous History: Had the usual diseases of childhood, after which he enjoyed good health until his present illness. Denies syphilis and alcoholism.

Present illness began June 13, 1898. While he was shoveling coal from a car onto a truck he experienced a peculiar sensation throughout the body. He is unable to give any fuller account of this sensation, only that it was peculiar and was not painful. After loading the wagon he crawled from the car to the truck and drove to the scales. During this time the "peculiar sensations" still persisted, and on arriving at his destination he was unable to descend to the ground on account of paralysis of the lower limbs. The time which elapsed from the beginning of this peculiar sensation to reaching his destination was about twenty minutes. On being assisted from the wagon he immediately complained of sharp, excruciating pains in the lower portion of the back, extending around to the abdomen and down the thighs.

He was seen at this time by Dr. H. B. Curtis, who found him in the following condition: The patient was suffering severe pain in lower portion of trunk and down the thighs. Motor power of legs was entirely lost, also sensation in lower portion of trunk and legs, excepting a small spot on the inner side of the

left leg, where a prick of a pin was perceived. The pulse was normal, temperature normal. Pain was relieved by large doses of morphine. In the course of twenty-four hours the motor power of the left leg gradually returned and by the end of the second day was fairly good. Sensation gradually returned. Reflexes at first were abolished. Had incontinence of urine.

I saw the case on the third day of his illness. He was suffering pain in the same location and of the same character as described above. The motor power of the left leg was good in every direction, but he was unable to make the slightest movement with the right. Sensation was present throughout the body. Knee jerks—right, absent; left, increased; ankle clonus absent; deep reflexes of forearm—right, about normal; left, the same; masseter reflex absent; plantar reflexes—right, slight; left, absent; abdominal reflex was not taken. There was no ataxia, nor paralysis in the arms. Facial muscles were normal. All the special senses were normal. At no time in the history of the case was the intelligence impaired. No evidence of atheroma of the blood vessels. At the time of the examination the patient complained of a girdle sensation and had incontinence of urine and feces. The following day the patient was in the same general condition, excepting that nausea was added. During the evening he made a sudden movement, suffered severe pain in the back, and in a few minutes had a general convulsion, in which he died.

From the foregoing symptoms the diagnosis spinal meningeal hemorrhage was made and was confirmed at the autopsy held about eighteen hours after death. Nothing abnormal was found until the spinal canal was opened. On removing the spinous processes the canal external to the dura was found to be filled with liquid blood and a few small clots. The latter were found in the lumbar region. Membranes of cord were slightly congested. Cord was normal.

In arriving at a diagnosis in the case one can readily exclude disease of the brain by the non-involvement of the cranial nerves and the character of the paralysis, along with the concomitant symptoms of spinal cord lesions. The sudden onset of the symptoms would exclude all spinal lesions in the adult,

excepting the vascular and those produced by sudden compression of the cord by displacement of the bone.

In hemorrhage into the spinal cord the paralytic symptoms, as a rule, come on immediately and are persistent, along with the localized pain occurring at the point of rupture, which is not so severe and at times may be entirely absent; although in some cases where the hemorrhage is large and breaks through the substance of the cord into the membranes there will be added the irritative symptoms of meningeal hemorrhage.

Extra-dural spinal meningeal hemorrhage is not a common occurrence in the adult, except when following some injury, such as blows or falls, while in the new born it is comparatively a common occurrence, probably due to rupture of a cerebral meningeal vessel during birth, and the blood descending to the spinal membranes; although Schaffer reports one hundred autopsies of new born infants in which ten had blood extravasated into the vertebral canal, without the meninges of the brain being involved.

In the case under discussion none of the common etiological factors were found to account for the hemorrhage, and after studying the case the only cause that I was able to ascertain was severe muscular strain or over-exertion, which is the rarest of all the etiological factors.

William Bain[1] reported a case similar to the one under discussion occurring in a girl 18 years of age who was troubled with constipation. On December 21, 1894, in the evening, she took a cathartic for her bowel trouble, rested well, got up about 6 a. m., and in one-half hour her bowels moved; returned to work and complained of numb and tingling sensation all over the body. When the physician was called the patient was in the following condition: Complained of difficulty in breathing, pain in the back of the neck, loss of motion and numbness in the upper and lower extremities. Mental condition good. Temperature 98, pulse 52. Could not move the left arm nor the right leg, but she could move the left leg with an effort, and the fingers of the right hand slowly. Knee jerks absent, sensation distinctly lessened. Patient went into collapse and died. Post mortem showed

[1] British Medical Journal, August 21, 1897. Page 455.

a comparatively small clot of blood at the third cervical vertebra between the dura and bone, the longer portion being on the right side. Severe muscular strain was the only cause found in the case.

The most common location for spinal meningeal hemorrhage to occur is in the cervical region. The location of the pain, paraplegia coming on suddenly with no involvement of the upper extremities or respiration, in the case which I have reported, would lead one to the opinion that the hemorrhage occurred primarily in the lumbar region of the spinal canal, as was demonstrated to be the case at the post mortem.

The convulsion in the case I have just reported must have been due to great irritation of the spinal membranes, or of the medulla, or of both, by the large quantity of blood. It has been demonstrated that if we irritate the membranes of the spinal cord or brain convulsive movements will ensue. The sudden termination was probably due to paralysis of the cardiac and respiratory centers by pressure.

DISCUSSION.

Dr. J. T. Eskridge—In regard to the case that Dr. Hopkins has just reported, it has been my good fortune of late to have seen a case of what was probably an extra-dural spinal hemorrhage in a horse. I made that diagnosis and suggested a treatment. I saw the veterinary surgeon afterwards and he had made the same diagnosis, and informed me—which was entirely new to me—that it was a very frequent disease in the horse and that they almost invariably get well. Now, we know that it is not a common disease in man. I am very curious to know the difference in the anatomy between the spinal canal of the horse and man. I have not had time to look it up. I have talked with one or two veterinary surgeons since and they assured me it is quite a frequent disease in the horse. In all essentials this horse I saw had all the typical symptoms of a person suffering from hemorrhage in the spinal canal,—spasm, intense pain, rapid respiration, etc. It was a very valuable horse, and within a few days it began to get better; it was able to stand, and within two weeks from the time that I saw it it was nearly well.

TETANUS TREATED BY ANTI-TETANUS SERUM, WITH REPORT OF A CASE.

BY T. E. TAYLOR, M. D., DENVER.

The frightful mortality attending tetanus when left to run its natural course, and the almost complete failure of the ordinary therapeutic measures to favorably influence the course of the disease, lead us to look with favor upon any new remedy which promises benefit. The demonstrated infectious nature of tetanus, and the accepted therapeutic efficacy of the antitoxic treatment of diphtheria and, in minor degree, of the streptococcus infections, together with the successful immunization of animals against tetanus cultures by injections of anti-tetanus serum, give a rational basis for the trial of this product in cases of developed tetanus. The considerable number of recorded cases exhibits a diminished mortality; and as, in many of the fatal cases, it was used only after the disease had already continued several days, we may hope for a greater improvement when it is used early. Such a favorable case I am able to report:

Mrs. J., married, mother of two children, called on Dr. A. E. Grant to attend her on January 27, 1899. She gave a history of a long series of miscarriages and resulting uterine disorders, and stated that for several days she had been flowing excessively and something had passed from her which was destroyed without examination. She had missed one period, and she supposed that her menstruation was so profuse for this reason. She strenuously denied having in any way induced an abortion. On the 24th, three days before, she had experienced chilly sensations, and thought she had caught cold. As the hemorrhage was severe, and the doctor had no gauze or cotton with him, he tamponed the vagina, using a clean cloth furnished by the patient which was soaked in a solution of bichloride. Next morning she complained of stiffness of the neck and jaws, not being able to separate her jaws more than one-half inch. Alarmed by these symptoms, Dr. Grant proposed a consultation. We saw her soon after noon, when, in addition to the difficulty in opening her

jaws and stiffness of her neck, she complained of soreness in the thoracic muscles. The facial muscles were not noticeably affected, though there was heightened reflex irritability. The temperature was 99½, pulse 95.

We agreed that a thorough curettement of the uterus and irrigation of its cavity was indicated, and this was done, the uterus being irrigated with a solution of bichloride 1-4000 and uterus and vagina being packed with iodoform gauze. She was then returned to bed and ordered full doses of bromide and chloral (though nausea prevented much being administered), and 4 c. c. of P. D. & Co.'s anti-tetanus serum, which was injected under the skin of the abdomen. We saw the patient again together at noon January 29, and found the stiffness of neck and jaws nearly gone. She was given an additional injection of 6 c. c. of serum. The nausea still prevented the administration of much medicine by the stomach. The packing of uterus and vagina was removed and an antiseptic vaginal douche given.

On the following day the stiffness of muscles had entirely disappeared, and the patient made an uninterrupted recovery.

This termination of such a grave disease is as unusual as it is gratifying. Indeed, it is so very unusual that it compels a close scrutiny of the diagnosis, for, of all the forms of tetanus, that following an abortion is perhaps the most hopeless. Gowers says "a recovery is practically unknown." There are only two other conditions which could have been mistaken for tetanus in this case—hysteria, and rheumatism. The latter frequently causes a stiffness and soreness of the muscles of the neck not unlike commencing tetanus, but rarely, if ever, affects the jaw. The patient was not subject to rheumatism and had not caught cold, while her abortion, possibly self-induced by septic instruments, had certainly opened a channel for infection. Hysteria may more or less closely simulate tetanus. In regard to the differential diagnosis, Gowers says: "In hysteria, tetanoid spasm is rare, except as part of a convulsive attack. But trismus, causing persistent closure of jaws, occurs in hysteria. It may succeed a convulsion, and last till another, or may come on without obvious cause, continue a few hours or days and then suddenly vanish. It is prone to recur, and this character, the

suddenness of onset, its complete degree, the absence of rigidity in the neck, and the presence of other symptoms of hysteria, rarely leave any doubt as to its nature." There were no other symptoms of hysteria, nor was there any history of previous hysterical attacks, so that this fact, with the marked rigidity of the neck, enables us to exclude this condition.

White and Peterson say of hysterical trismus: "It usually appears suddenly after a hysterical convulsion and suddenly disappears and recurs, and lacks the nuchal rigidity and mental clearness of tetanus." The prompt response of the disease to the injection of the serum, which was used as soon as the diagnosis was made, favors the view that one reason for the slight benefit of serum treatment of tetanus hitherto has been its too late use. White and Peterson, in their late and valuable work on nervous diseases, enjoin the early use of the serum, in addition to other therapeutic measures, and express the hope that it may be improved so as to be more efficacious.

SYMPOSIUM
ON
LACERATIONS OF THE UTERUS, VAGINA AND PERINEUM.

1. THE VARIETIES—THEIR CAUSE AND PREVENTION.

BY R. W. CORWIN, M. D., PUEBLO.

To economize time I have taken the liberty of placing before you charts, representing classifications of varieties and causes of lacerations or ruptures of the uterus, vagina, and perineum. Having them before us during this discussion may somewhat aid those interested, and they will assist me to the extent of making it unnecessary to consume time in further calling your attention to that portion of the subject referring to varieties and causes of laceration. The classifications are imperfect and may appear somewhat arbitrary, but they seem to me best adapted for this discussion.

Ten minutes is too short a time to even review this extensive subject. I shall therefore confine my remarks to the prevention of lacerations.

There are many rare causes of rupture of the uterus we shall not have time to consider. I can not, however, pass over the prevention of the rupture of the body of the uterus without mentioning the pernicious use of ergot. The younger members of our society may never have the experiences that have been afforded the older physicians. Doctors as well as other people learn. The ignorant midwife is rapidly being replaced by the skilled and trained nurse. Many of us have known ergot to be administered because the pains were weak and at long inter-

vals, no matter what the conditions or causes. When the os is rigid never give ergot. Do not give ergot simply because you are in a hurry. These may seem unnecessary precautions, but let me tell you many a dose of ergot has been administered under precisely these conditions.

When the os is rigid the energy of the uterus should be controlled, not forced. The child will move in the direction of least resistance, and that may not be toward the os. Says the American Text Book of Obstetrics, page 612: "The administration of ergot during labor is at times directly responsible for uterine ruptures. The writer remembers a case of a multipara with central placenta prævia, in which the attending physician had plugged the vagina very effectively, and at the same time had given the patient a teaspoonful of ergotol. The tampons, together with the mass of placenta, made it impossible for the presenting head to enter the pelvis; it escaped to the left iliac fossa, and when the writer saw the patient, three hours later, he found a transverse laceration on the left side of the uterus, a little above the inner os, through which the head had entered the abdominal cavity." What is true of the body of the uterus is true of the cervix, regarding the use of ergot.

To permit the escape of the child the os must be dilated. This can only be accomplished in three ways:

1. By slow dilation.
2. By rapid dilation.
3. By incision.

Slow dilation should, of course, always first be considered. This may be assisted by the use of anæsthesia, opiates or other sedatives. Often I have been called to a patient and found her in severe labor, nervous, and the os rigid; a small dose of morphia, administered hypodermatically, put the patient to sleep and the uterus at rest, during which time the os relaxed and most satisfactorily dilated—thus protecting the cervix. Herman, in "Difficult Labor," page 269, makes the following statement: "The commonest immediate cause of rupture of the uterus is the administration of ergot in obstructed labor. Ergot produces tonic contraction of the body of the uterus. If obstructed labor be left to itself, the conditions leading to rupture

of the uterus, as a rule, develop so slowly that by the delay in delivery ample warning is given to the most ill-instructed accoucheur that there is serious hindrance. But ergot hurries on the catastrophe; so that if you give ergot in labor without ascertaining the size of the pelvis and that of the child, rupture of the uterus may be the first intimation that there is anything abnormal."

Skill and judgment will be taxed to prevent rupture when we know that Cesarean section or other operations leaving scar tissue have been performed, or where tumors exist, or we have reason to believe the uterus is diseased or its tissue weak. To prevent laceration under these conditions, it may be necessary to control labor pains and dilate the os artificially to relieve the uterine walls.

If life depend upon immediate delivery, the os may best be dilated rapidly and the cervix protected by prepared sponge tent, finger, and water bag. It is better to incise the cervix than to wait for it to be lacerated. It is perhaps unnecessary to mention that to prevent damage to the cervix too much care can not be exercised in inserting the hand into the uterus and in turning; that one should not wait for the cervix to be caught between head and normal or abnormal bony processes, and not misplace instruments, yet thus much injury to the cervix has been caused.

Laceration of the vagina may be prevented:

By not permitting the cervix to be lacerated.

By not allowing the head to remain too long in the passage of a contracted pelvis.

By skillful use of instruments. I was called in consultation once to find that one blade of a pair of forceps had been forced through the vagina into the abdominal cavity.

By emptying the bladder and bowels.

By correcting position of uterus.

By keeping the finger out of the rectum.

In *Rupture of the Perineum*, three factors are to be considered:

1. Condition of the tissue.
2. Size of the child.

3. Speed of the child's movements through the passage.

In the first, if the tissue will not stretch and the diameters of the child are larger that the diameters of the opening, only two things can possibly happen—the decreasing of the one or increasing of the other.

In the second case, if the child be larger than the external passage, and it is to be born alive, its diameters can not be greatly altered.

In the third, the speed of the child is of importance. Much can be done to prevent laceration by controlling the child's movements.

Lubrication in resisting tissue I believe to be of no value in overcoming laceration. It may hasten delivery but not stretch tissue. The position of the child should be ascertained and corrected if necessary.

Sudden dilatation must be prevented by controlling the mother's action and by holding the child. Any one who has seen the old German or Austrian midwife clap her hands over the presenting portion of a child and hang on can appreciate efforts in this direction. Supporting the perineum, or attempting to press it from the sides toward the center, is futile and damaging. Slow stretching with occasional rest is most to be desired.

If after utmost dilatation the diameters of the outlet of the vagina are too small to admit of the passage of the child, instrumentally or otherwise, and rupture of the perineum is inevitable, episiotomy is advisable. The incision or incisions should be made in the directions indicated on the chart. This is the safest and most rational method of protecting the perineum. It causes no great amount of pain if the patient be conscious, none if under an anæsthetic. The depth of the laceration is under the control of the operator, the position elected, and reparation simple.

Now my time is fully exhausted. I have covered little territory, offered nothing new, but possibly have suggested sufficient to provoke discussion—the principal object of my paper.

2. SYMPTOMS AND SEQUELS OF FRESH LACERATIONS.

BY JESSE HAWES, M. D., GREELEY.

Not all lacerations of the parturient canal during child-birth are pathological. Some tearing of the os usually occurs in all labors; some tearing of the fourchette occurs in practically all primiparous cases. The little tears may be called physiological; they almost never give rise to pathological results.

In this paper, to which only ten minutes is allowed, no attempt will be made to discuss lacerations of the uterine body, and less time will be given to the signs and symptoms of fresh lacerations than to their sequels. There have been no new signs or symptoms brought forward during the past year—do not expect them in this paper. Let us deal with the anatomical parts in the order named above.

A tear of the cervix usually gives rise to an increased amount of pain at the moment of laceration; this symptom is rarely available, as the parturient patient usually regards any amount of pain as about the limit of human endurance and in her own way gives expression to that feeling. Yet there are "silent tears" in which the patient gives no increased vehemence to her cry—makes no complaint, and is not cognizant of any added pain. Snapping of the muscular fibres is often perceptible if the fingers of the attendant should chance to be pressing the cervix near the site of the laceration; I have several times noted this sign. Hemorrhage marked by a constant flow of arterial blood may occur if the circular artery is involved, yet the head of the child, filling completely the tense vagina may, and usually does, prevent the appearance of the tell-tale blood externally.

Laceration of Vagina: The head in the vagina may lacerate the fibres of the levator ani during a paroxysm without laceration of the vaginal mucous membrane; when the paroxysm has passed off and the head has receded the laceration may be felt through the unruptured mucous membrane. There may be no apparent lesion externally, yet by separating the labia the most

dangerous of all lesions as regards its after consequences may be detected. A simple external tear is of little importance beyond opening an avenue for the entrance of germs. It is the tear of the muscles and fascia of the pelvic floor which entails rectocele, cystocele, retroversion, and uterine and ovarian prolapse and a relaxed vaginal outlet.

A large stain of blood on the shoulder and trunk is often one of the warnings that there has been a tear in the anterior part of the vagina, as blood comes from the external part of the vaginal orifice when lacerated as soon as the head is born; while pressure of the body on the deeper parts will usually restrain the hemorrhage originating there until after such pressure has been removed. Extensive laceration of the vagina may be suspected when the head recedes excessively after an expulsive paroxysm.

Lacerations of Perineum: These may sometimes be felt by the hand of the attendant at the moment of rupture, but I have often been surprised to find a rupture when no tactile evidence had been recognized during the expulsion of the head. The sensations communicated to the hand of the attendant are those of snapping of the muscular and fibrous tissues. The pain is increased and often the expulsive effort is increased by the injury to the perineum. After the birth of the head, while the neck is pressing upon the perineum, the laceration may often be recognized by the touch; and after the expulsion of the whole body the experienced touch will *usually* recognize the injury, but I have not infrequently made a diagnosis of no rupture when vision has shown that my touch was imperfect. Do not depend upon touch alone if at all in doubt.

The symptoms of laceration of any portion of the parturient canal are chiefly pain and often increased hemorrhage. If there is free bleeding when there is no after pain, examine closely by touch, and, when possible, by vision, for a laceration; there should be but little bleeding between pains. One of the worst hemorrhages I ever encountered was due to a laceration of the cervix and vagina.

Sequels: Cervical lacerations, when small, usually heal spontaneously and have no sequels; among the sequels that fol-

low when the rent is larger are cancer, subinvolution, venous stasis causing pelvic aches and pains, a change in the menstrual flow, which is often increased, sometimes diminished, and inflammation of the periuterine tissues due to the absorption of septic material.

Sequels of Lacerations of the Vagina: 1. Rarely, complete union. 2. Partial union by first intention and a cicatrix which may contract sufficiently to compensate for deficiency created by the tear. 3. Cicatrization and non-union producing cystocele, rectocele, and even complete prolapse of the cervix, bladder and uterus, may occur from the enlarged and relaxed vaginal outlet. Prolapse usually entails leucorrhoea and endometritis; constipation is usually a consequence of rectocele.

The nervous symptoms referred to the stomach and head are expressions of a disturbance of the sympathetic nerves.

The *sequels of perineal laceration* are largely those enumerated under the head of lacerations of the vagina, since the perineal laceration takes away a support of vaginal walls. We meet with cases complicated with nervous disturbances without being able to afford a definite explanation showing the relation between cause and effect which, however, a subsequent operation clearly demonstrates; such a laceration may cause a general irritability.

I am not aware that any branches from the sympathetic system have been demonstrated in the perineum, but they are freely distributed to the neighboring parts and the indirect injury to those parts would account for many sympathetic symptoms. *Laceration* of the ostium vaginae makes it patulous, permits air to pass in and out the vaginal canal, sometimes giving the sound of flatus passing from the bowels.

This concludes the obstetrical and gynecological aspect of the subject embraced under our title, but there is another and exceedingly important phase that will not, can not, be passed unrecognized by the observant physician. I refer to the psychological correlation existing between the sexual organs, as the servant of the sexual instinct, and conjugal love.

There is no questioning the fact that the condition of the sex organs markedly modifies the sexual instinct, and, through the sexual instinct and appetite, modifies conjugal affection.

In what I may say upon this subject I desire to speak plainly, yet I would not willingly use an expression that could be considered tainted with impurity. I would not write for the purpose of tickling prurient ears, nor for the entertainment of those who feast upon samples of sexual perversion or abnormality. I would have my language such as legitimately belongs to a discussion before a medical society of the sequels of lacerations of the parturient canal.

Years ago a thoughtful student of the subject defined conjugal love as "an animal instinct heightened by imagination and modified by reason." Idealists, a few men and many women, will repudiate with disgust the thought that conjugal love, the sweetest, purest, noblest, holiest characteristic of human beings, should be constituted in any part of animal instinct. Yet most thoughtful physicians and physiologists will agree with the observation of Marion Crawford, "There can be passion without love; there can be no conjugal love without the passion that comes from the sexual instinct"—or with Dr. Butler, who asks: "What is conjugal love, but, in part, a manifestation of the sexual instinct?"

Healthy, normal sexual organs under the influence of a chaste, normal mind are a portion of the human organism designed to express the manifestations of love; while torn, painful, tender sexual organs are abnormal, and when they, as agents, are required to express such manifestations they rebel at their normal functions.

The contact of the male organ with a torn, tender cervix or prolapsed, congested and painful ovaries, or with subperitoneal inflammatory exudations, gives rise, not to the normal sensations of coitus, but to pain, distress, agony, torment, or torture, and after many repetitions the act is awaited with dread and the actor is equally dreaded. How many times have the physicians of this body heard the statement "I dread to have my husband come near me?" 'Tis but a short step from this justifiable mental state to that of dislike, detestation or hatred.

One of the functions of the constrictors of the vaginal orifice is to press the male organ against the clitoris and heighten the venereal excitement. Rupture of the constrictors destroys one

of their functions—the function I have named—and to that extent takes from coitus its normal sensations; to that extent renders the act merely mechanical or disagreeable or painful to the female; to that extent the injury becomes a factor in marital trouble.

How intimate is the relation between physical conditions and psychical states! How important for the happiness of our patrons that we, as physicians, recognize that relationship, and point out to the aggressive and sometimes seemingly brutal husbands the great injury, wrong, he may accomplish!

Lest these statements should be regarded as only a prejudiced tirade against one sex, it is only fair, though not properly a part of the subject under discussion, that I should call attention to causes of conjugal estrangement originating from another source—a kind of offset to the preceding.

Normal sexual organs influenced by a normal, properly educated mind are essential factors in the manifestations of connubial affection, but not infrequently the mind has not been properly educated. Many young ladies enter the marriage state with no knowledge whatever of their sexual organs, or with their minds filled with the most false and injurious ideas concerning the relations that should exist between the sexes after marriage.

One charming young lady of my acquaintance arose from her bridal couch and rushed, half clothed, to her mother's chamber, crying that her husband had offered her a gross, unpardonable insult, since neither she nor the husband desired children at an early date.

From prudish companions she had acquired the idea that coitus was a vulgar, sensual, shameful act at all times and was only to be excused by the duty of perpetuating the species; that if it occurred under any other circumstances it were carnal, indecent, beastly. The shock to her moral sensibilities was so great that the respect and affection previously given to the lover were thereafter denied to the husband, and divorce was an early sequel.

In another case a pure but ignorant young girl doubted her newly wedded husband's morality and charged him with being

lustful and lecherous until she made a confidant of a wise old married friend.

Neither of these young ladies had been informed of the fact that a congestion of the reproductive organs of both sexes is normal and chaste under certain marital circumstances, and awakens desires that, when "guided by reason," were better gratified than crushed.

The betrothed maidens who unfortunately have been taught by shrew mothers or by prudish, soured old maids that man's marital love is only legalized lust, that his affection is affectation, that his sexuality is only sensuality; who in the years after marriage plume themselves upon their "chastity" and repugnance to connubial obligations; who repel any uxorious advances liable to lead to a closer intimacy; who often remark "That is all a man cares for";—these persons are not likely to retain through a lifetime the affection given to them during the months of courtship.

If my observations are any criterion by which to judge of the experiences of others, I am safe in saying that a fair minority of women are imbued to a greater or less extent with the ideas named above; to a lamentable extent they regard themselves as martyrs to the passions of their husbands. Some in years modify their views, a few seek relief in the divorce courts, and not a few retain their views through all their lives, bearing their martyrdom more or less patiently, yet never failing occasionally to remind their spouses that they are conscious of their own degraded and suffering position.

Not a few husbands, smarting under the unjust accusations, seek less and less often the embraces of the wife, and, recognizing wedded life as a gross caricature of the ante-marital state, in anger or resentment secretly solicit the companionship of ladies whose virtue they suspect or know to be a little "off color."

These latter statements are not offered as an excuse or palliation for matrimonial infidelity; they are offered because they are simply facts. It does not require a philosopher to draw conclusions. I have called attention to views and facts well known to all obstetric, gynecological or general practitioners. The subject is of sufficient importance to merit more consideration than

it receives. As an illustration of some of the views I have given I append a single case that came under observation while I was preparing this paper:

A lady, refined, highly educated, suffered severe lacerations of the parturient canal during a confinement; a subacute inflammation of the cervix and perineum persisted through several months. Intercourse was exceedingly painful, and, after repetitions became abhorrent, a dislike for the husband ensued and separation was seriously considered. Rational treatment restored the sexual organs to a normal condition until another parturition produced the former physical and mental state. Another course of treatment brought back the better condition. Epitomizing her experience, she remarked to me: "Doctor, when my reproductive organs are diseased my husband and my home are hated; when they are normal, home is heaven; husband is harmonious and I am happy. Whole and healthy reproductive organs are important factors in making an ideal home."

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3. IMMEDIATE REPAIR: INDICATIONS, METHOD AND TECHNIQUE.

BY SOL G. KAHN, M. D., LEADVILLE.

This particular division of the symposium is of the greatest importance to the patient. To procrastinate may lead to dire results, and more especially where we find a ruptured uterus, which rupture may be complete or incomplete:—complete, when the laceration is through the muscular wall and peritoneal covering; incomplete, when the muscular tissue only is involved, the latter occurring less frequently.

The varieties of the tears are as variable as the extent, and the treatment varies according to the situation and extent of the rupture. As soon as we discover a ruptured uterus our first care is the removal of the child. If partially retained in the uterus, delivery through the natural passage should at once be attempted. Generally we are able to extract the child by the feet. After removing the child and the placenta, the parts are thoroughly cleaned and examined, and hemorrhage stopped. If

the tear is incomplete, packing with iodoform gauze will control hemorrhage and give good drainage. This same treatment will apply when the tear is complete, but small, and upon the posterior wall, and when no liquor amnii or blood has escaped into the abdominal cavity. When this condition exists a laparotomy is necessary; also when the child and placenta, or either, are entirely in the abdominal cavity. After opening the abdomen and ascertaining the exact condition with which we have to contend, we must decide whether it is more advisable to amputate the uterus or sew up the rupture. If the rent is not too large or ragged and we can approximate the torn surfaces, sewing with deep and superficial sutures may be the better plan. If the rent is large and extends to the fundus, amputation or abdominal hysterectomy may be the best.

The operator must determine which course to pursue after opening the abdomen and ascertaining the exact condition. Whichever mode of procedure is adopted, and whether the uterus is either stitched or removed, our attention is next directed to the removal of blood and debris from the abdominal cavity, either by flushing or by carefully removing with sterilized gauze sponges. Some surgeons condemn flushing, while others as rigorously advocate it; and we must leave the method to the choice of the individual operator.

Our next step, suturing the abdomen and the question of drainage, has caused much discussion, first, as to the suture material and, second, whether or not to drain, neither of which come under consideration in this paper.

Cervix. Immediate repair of lacerations of the cervix must be considered from different standpoints—that of the obstetrician in the lying-in institution or a hospital, and that of the general practitioner. The latter having by far the greater number of cases, I will take his position, which is also mine, in considering the treatment. Lacerations of greater or less extent occur in nearly every confinement; and to attempt to approximate the torn dilated edges of a relaxed cervix requires an experienced hand, while stitches placed immediately in such a cervix are likely to be too loose to hold at the end of twenty-four hours. When the tear is not very extensive it frequently heals

spontaneously, and in the majority of cases it is advisable to wait till the patient has recovered from her confinement, and do a secondary operation. The exception to the rule is where the cervix is completely removed and comes away as a ring in front of the child, or where the laceration is bleeding freely, which must be stopped. If hot water will not effect this, a tampon of iodoform gauze placed in the lateral vault of the vagina is usually effective; but if bleeding continues, one or two stitches will give the desired result.

Vagina. Tears of the vagina requiring immediate repair, excluding those extending from cervix and perineum, are of rare occurrence. When they do occur they are seldom extensive, and packing with strips of iodoform gauze, also irrigation with hot, mild antiseptics, will usually suffice. Vesico-vaginal fistulae and recto-vaginal fistulae do not manifest themselves at once, so that a secondary operation is the only treatment we can employ. A rupture of the posterior vaginal wall into the rectum must be repaired at once by buried catgut sutures and interrupted silkworm gut or silver wire.

Injuries to the anterior wall caused by forceps blades or presenting part are seldom deep enough to require suturing, but when they do exist must be sewed at once, as bleeding may be very profuse.

Perineum. The perineum must be carefully examined after every confinement, and not to repair immediately is considered gross negligence at this day and age. A tear of the third degree may be delayed a few hours, as any time within twenty-four hours in such a case is considered immediate repair. We may not be provided with the entire armamentarium to repair a ruptured uterus or cervix, but must go prepared to sew up a lacerated perineum. After examining the patient and ascertaining the extent of the tear, we place the woman across the bed, her buttocks resting upon the edge, her feet either braced against and upon the thighs of the physician, with knees widely spread; or, if we have plenty of assistance at hand, the legs are held flexed upon the abdomen by an assistant. The torn edges are then approximated and sewed from below upward, the operator placing the index finger of his left hand in the rectum.

The stitches are placed deep into the pelvic muscles, but with the finger as a guide in the rectum we avoid the danger of including that viscus, and our stitch encircles the entire wound. Several sutures are so placed, and, if the tear extends into the vagina, we can continue with interrupted sutures or a continuous one as best suits the individual operator. If the tear extends into the rectum we must sew that first, placing our knots in the rectum, and allowing the ends to remain so as to facilitate the removal; then we repair the perineum as before.

The suture material most preferred is silkworm gut or silver wire, but if neither are at hand silk will answer, the suture material being boiled for about ten minutes and the parts cleansed with mild bichloride. An anaesthetic is not required, as the perineum is so benumbed from the pressure of the presenting part that very little pain attends this usually simple operation when done at once. We must not forget to tie the knees together before leaving our patient, also placing a wet compress over the wound so as to extend into the vagina.

The patient is confined to her bed for two weeks, at which time the stitches are removed. The result of this operation is usually good, and when a secondary operation is required it is not near as extensive or difficult.

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4. SYMPTOMS AND SEQUELS OF OLD LACERATIONS.

(a) Local.

BY I. B. PERKINS, M. D., DENVER.

Laceration of the cervix in a greater or less degree is one of the most common of all gynecological affections.

Many of these lacerations, in fact most of them, are of so slight a character as to give rise to no special symptoms or sequels, and their existence is not known nor suspected by the patient until an examination for some reason is had, when they are noticed by the physician.

There are others, however, which have much to do with the patient's health and comfort, and give rise to symptoms and sequels often difficult to relieve.

Endometritis is very frequently caused directly by an old laceration, which need not be extensive as to external appearance provided it extends high up in the cervical canal. The endometritis thus caused may be the only explanation found for a salpingitis, or for a tubal or pelvic abscess with all of its resulting consequences.

Contraction of the tube which naturally follows such inflammation may be the sole cause of a future tubal pregnancy. A deep bilateral laceration is likely to cause eversion of the mucous membrane with erosions, and it is in this class of cases that carcinoma of the cervix is frequently observed to occur.

That carcinoma of the cervix in a majority of cases occurs in women who have borne children and who have more or less laceration of the cervix can not be denied; but that slight lacerations tend to any great extent to bring about this result I am not prepared to believe.

Lacerations of the perineum and pelvic floor call for treatment much more frequently. It is hard to conceive of a purely mechanical condition which can render a woman so miserable as a complete tear through the perineal body into the bowels. Following this condition will appear, first, a retropoised uterus, then a retroversion and prolapse of the organ, which will be in direct relation to the injury. This condition is not so likely to occur, however, unless in addition to the lacerated perineum there be a lacerated pelvic floor as well. Indeed, a badly lacerated pelvic floor with no injury to the perineum proper may often give rise to a far worse train of symptoms than the opposite condition. Relaxed vaginal outlet brings about these same results and these cases properly belong in the list of obstetrical lacerations, for in them the sub-mucous structures have been more or less lacerated even though the mucous membrane itself remain intact.

When the support has been taken away and the uterus must of necessity descend, the bladder is likely to be crowded down and out and you have cystocele with consequent bladder irrita-

tion. Also the muscular fibers anterior to the rectum, which are intended to increase the expulsive action of that organ, being severed, the pressure will be extended toward the vagina instead, and rectocele is the result.

Usually in all of these conditions there is leucorrhea, backache, pain and soreness in the pelvis, due to the inflammation caused by the pulling down of the uterus on its ligaments and the other pelvic organs.

(*b*) *Nervous.*

BY J. T. ESKRIDGE, M. D., DENVER.

I have not written out my remarks. I shall have been in Colorado fifteen years within a month or two, and this is the first year that I have not inflicted a paper on the State Medical Society; so I think you are very fortunate in escaping this time. I shall simply state some facts and try to draw a conclusion from them. I make this assertion, that the sequelae of pelvic lacerations can only be philosophically studied from the neurological standpoint. You may clinically study this subject from the gynecological standpoint, but not philosophically.

We sometimes forget the fact that man is an organism of periodic functions the same as woman. It was only three days ago that a patient was sent to me by one of the readers of this symposium presenting a history of epilepsy for twenty years, the epileptic seizures coming on monthly and lasting three days, beginning with severe convulsions and ending with light or petit mal attacks. All through these twenty years there has been little variation, scarcely any more variation than there would be in the menstrual period in a woman. Now, recall for a moment that nearly all the functions of every organ of the body are performed at periodic intervals; the nervous symptoms in women from uterine disorders are modified by the catamenia and its disorders, menopause, diurnal changes by seasons, cares, worries, child-bearing, sterility, sexual intercourse, nutrition, social conditions, and the thousand and one petty or major annoyances to

which women in civilized communities are subjected. Finally, over and above all, the inherent organization, hereditary or acquired, claims a large part in the resistance or non-resistance of women in bearing the ordinary extraordinary strains of life. In studying the effects of lacerations of the soft tissues we have to study the inherent organization of the individual—the power of resistance. You take one woman who is healthy and strong and she will bear with impunity lacerations for a great number of years that a person with a nervous organization will not stand. In fact, some persons may have the soft tissues lacerated for a long time and never experience any symptoms from them at all. They begin to break down, and then the causes that had existed for years are added to those of the run-down condition and we have two causes acting. The fact is this, that when a tissue that is supplied by the nervous system from the lower portion of the cord is irritated there is a very small reflex circle, an arc from one portion of the tissue to one segment of the cord and that is deflected out to another organ; that other organ is connected with the first segment and with the first segment above. In this way the longer the irritation lasts the higher the segments that are involved, the longer the train of segments from which the symptoms are extended. Therefore the first symptom we may have may be that the patient can not keep her feet still. The next symptoms may be pain in the legs, finally pain higher up; the liver may become affected, the intestines, the stomach, the lungs, the heart; and finally as segment after segment is involved in this reflex irrritation we have the reflex irrritation extending up into the medulla, and then finally to the highest centers of the cortex of the brain, when you may have a typical hysterical convulsion. Now, the nervous symptoms that follow lacerations of the soft tissues in the woman vary from the slightest to the most complex, and these depend entirely, not upon the size of the lacerations, not upon the duration of the lacerations, but upon the organization of that woman and upon the strain that is put upon her. Given a woman of strong organization, with strong power of resistance, and she will present no symptoms for a long time. I know it has frequently been my experience that women who have always considered themselves in good health, but have developed some nervous symptoms, have come to me

for examination, and, to be sure in my own mind that there may be no reflex cause, I have requested them to consult a gynecologist. On their coming back to me from the gynecologist they were surprised to find that there were various lesions in the pelvic organs. Such a woman frequently rebels when I suggest that an operation is necessary. Now, this is very easily explained. She has been so strong heretofore that these lesions have not given rise to symptoms, and she is astounded to find that she is the subject of these many disorders. Now, the gynecological examination was correct and the woman is a sufferer from these conditions, and it is now when she begins to break down that they become manifest. If she does not submit to an operation it will not be long before most physicians will hate to operate because they feel that they can not relieve the symptoms.

Now, what may we gain from such experiences? What inference may we draw from it? The inference is this, that all lacerations of any magnitude should be repaired as soon after they are made as possible, and especially is this so in the nervous. The more nervous the woman, the worse the heredity, the sooner the repair should be made. Do not forget that if you neglect to repair lacerations of any magnitude the time will soon come when the strongest constitution may break down, and the symptoms resulting from those lesions will establish the disease; that in these cases the longer the reflex irritation is kept up the harder it is to relieve, and in these old cases of soft tissue laceration of the intra-pelvic organs or the extra-pelvic organs, we will find that after we relieve the condition that has been in existence for years we do not relieve the patient, and thus gynecological operations sometimes come into disrepute simply because we do not relieve the patient by an operation. In these cases the surgical operation means only this, that the old lacerations are repaired and the immediate effects of such lacerations are gotten rid of, but that the reflex train of symptoms that have been kept up for years will exist until the nervous system and general condition of the patient are thoroughly built up by a long period of nursing, systematic feeding, and by other methods which are best suited for the relief of these old reflex conditions.

5. TREATMENT OF OLD LACERATIONS AND THEIR SEQUELS.

(a) *Surgical Treatment of Lacerations of the Cervix, Vagina and Perineum.*

BY W. A. JAYNE, M. D., DENVER.

As it is impossible to fully consider the surgical treatment of old lacerations of the cervix, vagina and perineum in the time allotted, I propose to confine myself to the presentation of a few salient points seemingly best worthy of discussion.

Lacerations of the cervix appear at any point in its circumference and are of varied degrees, from a mere nick to an extensive laceration extending beyond the vaginal vault even into the peritoneal cavity; and the question of surgical interference and repair after cicatrization has taken place must depend upon the pathological changes and symptoms already present or upon those which may follow.

The slighter form, that in which the laceration does not extend through the thickness of the cervix, may, as a rule, be passed over without interference. Exceptionally, in connection with them, we will note tissue change, or, in neurotic women, certain nervous symptoms for which there appears no sufficient explanation unless they are reflex and referable to the uterus. If, in such cases, the suspicion exists that the condition is in any measure due to the injury or its results, operation may be done with propriety, in the hope of checking the progress of the physical disease or of giving relief to symptoms which may be attributable to irritation of nerve ends caught in the cicatrix.

Unilateral, bilateral, multiple, stellate lacerations and tears of the anterior and posterior lip, involving the thickness of the cervix or extending to or beyond the vaginal junction, are very prone to determine the occurrence of pathological changes in the cervix and uterus, often aggravated in extent and character, and predisposing to displacement by increasing the weight of the uterus. In any one of these events pronounced symptoms

follow sooner or later. Occasionally, however, we do observe patients with extensive laceration of long standing without symptoms referable to it or apparent change in the tissues of the cervix. While such cases do not demand surgical interference and may go on indefinitely without any complication arising, in general I believe it advisable to repair the more extensive injuries, even in the absence of other indication than the injury itself. By so doing we stop the uterine catarrh that is so invariably present, and guard our patient from future complications to which the injury renders her extremely liable.

It is asserted and believed by many gynecologists that lacerations of the cervix predispose in later life to the development of carcinoma. If this is a fact, it is an additional reason for restoring the parts to their normal condition. Confronted by a laceration of the second or third degree, we should be very sure of our ground before advising that repair is not called for.

When, together with such lacerations as have just been mentioned, we find subinvolution, hypertrophy and hyperplasia of the cervix or body, cystic degeneration of the cervix, endocervicitis, catarrhal or hypertrophic, granulations, ectropion or other pathological condition, possibly associated with displacements backward or downward, we invariably have, sooner or later, as a result, a long and varied train of distressing, subjective symptoms, often nervous and reflex in character, which render the patient an invalid and demand relief. In these cases our course is clear. The injury should be repaired at the earliest convenient time, to check the progress of the changes already inaugurated and prevent further and more grave trouble.

Local treatment with general medication sometimes does much for these cases, both modifying the pathological conditions present and giving relief to the symptoms arising therefrom. A few are permanently relieved; the majority are only temporarily benefited. The success and permanence of medical treatment in the presence of definite pathological changes in the cervix is so uncertain that in the long run I believe we will do better by our patients by advising and performing an appropriate operation for repair, provided no definite contra-indication exists. The advisability of this course is emphasized when other conditions exist in the genital tract which require operation for their relief.

The operation most generally applicable is that devised and described by Emmet of New York, known by his name and fully described in all text books.

In cases of long standing, with gross pathological change, great hypertrophy, elongation of the cervix or ectropion, amputation of the cervix after the method of Schroeder or Simon, possibly modified to suit the individual case, is the operation of choice.

In all cases curettage should precede the operation for repair. Catgut does perfectly well as a suture material, and—owing to the annoyance and difficulty of removing sutures from the cervix—it should be chosen when the perineum is also repaired. In proper cases, with the usual antiseptic precautions, union by first intention should follow.

Acute infections of the genital tract, or inflammatory disease of the broad ligaments or uterine appendages, indeed any form of pelvic inflammation, should be considered as a contra-indication for operation during their presence. This operation is not urgent, and the time elected for repair should be when the patient is in the best possible condition. The possibility of future pregnancy should not be considered a bar, since we find that dilatation of the cervix goes on quite as readily after repair as though no laceration had occurred or operation been performed, and there is no greater liability to future rupture.

Lacerations of the upper two-thirds of the vagina occurring during child birth, whether associated with lacerations of the cervix or not, heal soundly by granulation, if not by first intention, and only rarely do they require subsequent attention.

It is far different with lacerations of the lower portions of the vaginal canal, involving the perineum to a greater or lesser extent, as they usually do. Here we have an intricate problem to deal with, the principles of which were clearly worked out and set forth by Emmet many years ago, are now accepted by all gynecologists, but are not always fully comprehended and applied at the bedside or in the operating room.

Briefly, lacerations of this part of the genital tract as a result of child birth derive their importance, not from the injury to the vaginal mucous membrane or the skin of the perineum,

extensive though these may be, but rather from the injury to the underlying structures—muscles and fascia—that form the pelvic floor and give it its strength, enabling it to resist intra-abdominal pressure and efficiently support the pelvic organs.

Some of the most serious injuries are those in which there has been no superficial tear, the injury being confined to the subjacent muscles and fascia, which have either been so overstretched that they do not regain their resiliency and tone, or in which the fibres themselves have been actually torn, resulting in a relaxation equally disastrous with those in which the mucous membrane and skin have shared in the injury, and more serious in character because deceptive and not so readily recognized at the time of the injury or afterward. Slight superficial tears may be associated with serious injury to the muscles and fascia or vice versa.

Careful study and analysis of these injuries at the time of their occurrence have demonstrated very clearly that the laceration is seldom in the median line in the vagina; that in the great majority of cases it begins in one or the other sulcus, or both, and, passing through the mucous membrane, the anterior fibres of the levator ani and its associated fascias are stretched and torn from their attachments. The laceration extends from above downward diagonally toward the median line, which, if finally reached, is approximately at the fourchette and superficially at the skin of the perineum proper. If both sulci are torn, the two tears meet at the fourchette, giving what has been happily styled the typical or Y-shaped lacerations, the branches representing the sulci, the stem the skin of the perineum. It requires but a continuation of the tear to rupture the sphincter ani and involve the rectum.

Lacerations of the pelvic floor, in which the fibres of the levator ani and other muscles and the various fascias are involved, demand prompt, efficient and intelligent operative relief, having constantly in view that the union of the torn ends of muscle and fascia is the essential condition of complete repair, without which our efforts are vain. The mucous membrane and skin may unite by first intention or granulation, as the case may be, but unless the lacerated muscle and fascia have been care-

fully rejoined by sutures and united these structures remain retracted, and the pelvic floor is no longer capable of supporting the weight of pelvic organs and intra-abdominal pressure.

When we find these conditions present, even in modified degree, symptoms indicating loss of strength and displacement of pelvic organs and tissues follow sooner or later, and no unnecessary delay should be permitted before the parts are restored to their normal relations.

Prevention is better than cure, and we should not in these cases wait until displacement, often so difficult of cure, has occurred, but rather anticipate and guard our patient from added suffering and risk.

Innumerable operations have been suggested for the varied conditions following upon this injury. Each, more or less, has its peculiar sphere of adaptability, but no operation will give a successful result which does not contemplate and efficiently attain the union of the retracted fascia and muscle fibres.

Emmet's, Hegar's, Simon's, Tait's, and all other plastic operations for the repair of the pelvic floor, or so-called perineum, are designed to accomplish this end and do so each in its own way. But success does not lie so much in the operation chosen, however modified and adapted to the case in hand, but rather in the skill and understanding of the operator. It is not sufficient to correctly make the denudation and neatly close it. Success depends upon the efficiency of the work beneath the surface, on the manner in which the needle is inserted, the sutures passed, the success in reaching and drawing together the separated and retracted tissues, in lifting the pelvic floor and bringing the posterior vaginal wall forward in contact with the anterior, giving the bladder and deeper pelvic organs their natural support.

I regret time does not allow me to go further and speak in detail of the operations themselves. It is sufficient, however, if I have clearly enunciated the broad principles which should guide us.

(b) *The Surgical Treatment of Uterine Displacements Resulting from Laceration of the Pelvic Floor.*

BY C. K. FLEMING, M. D., DENVER.

My colleague just preceding has spoken of the surgical treatment of lacerations of the pelvic floor, which in itself is oftentimes sufficient to correct the resulting uterine displacement. The subject allotted to me, undoubtedly, is that especial surgical treatment demanded in those cases in which plastic operations are not deemed sufficient and it therefore becomes necessary to adopt more radical procedures.

The uterine displacements which may demand operation are retro-displacement and prolapse. Prolapse being simply a condition following or secondary to retro-displacement, as the uterus in all cases before it can become prolapsed must be in a state of retroversion, we shall confine our remarks to the radical means of treating retro-displacement of the uterus. Various operations have been devised to meet the indications for treatment of this condition. The principal of these are ventro-suspension of the uterus—which is also called ventro-fixation, hysterorrhaphy or hysteropexy—and Alexander's operation. To these two, which may be called classical operations, may also be added vaginal fixation and an operation recommended by Aubean of France, and later by Pryor of New York, which we will speak of later.

It may not be out of place at this time to give the indications for the radical treatment of this condition, for all cases do not demand such measures. The question then naturally arises: Is a retro-displacement an abnormal one and an indication for operation?

It is a recognized fact that the normal uterus is freely movable and constantly changing its position according to its environments. Baldy, in a recent discussion on this subject, stated that "there is no normal position of the uterus, it being a movable organ," and that "if the supposed displacement produces no symptoms, that position is normal to that woman." It may be stated then that all retro-displacements do not call for

radical treatment, but that those cases in which the symptoms can be traced to the displacement *per se* should be treated accordingly.

Each of the operations mentioned above has its indications and contra-indications, so that a careful study of each case will determine the operation suitable.

Ventro-Suspension: It may be an interesting historical fact to mention before this society that Dr. Thomas H. Hawkins, one of its members, was the first to perform this operation, which was done on the third day of January, 1883, in this city. The tubes and ovaries were removed at the same time, which was the first operation of this kind done in Colorado. Later the operation was performed in Germany, and by Howard Kelley of Baltimore, who published a paper reporting his first case, April 25, 1885. The priority of ventral-suspension therefore belongs to Colorado.

The field of this operation is larger than that of any of the others. Its indications are a retro-displaced uterus, adherent or not, producing symptoms; when the uterus is large and heavy; and particularly when complicated by unilateral or bilateral pelvic disease.

The advantages of this operation are that it requires but one incision; it is easily performed and requires but a few moments; and the adnexia can be examined and removed if necessary, or treated according to indication.

Various objections to ventro-suspension have been raised by different operators, none of which, to my mind, are pertinent. An increased danger of abortion and difficult labor have been mentioned, without, I think, much foundation. The percentage of abortion in women who have not received such operations is large enough, goodness knows, as we find mentioned in various books of obstetrics that at least 20 per cent. of all pregnancies end in abortion. On the other hand, in statistics of seventy-five cases operated upon at Johns Hopkins Hospital, fourteen afterwards became pregnant, and only one is reported as having miscarried and then only after violent dancing. It is true that a number in this series had some abdominal pain during the

months of gestation, but whether this was due to the fixation or not I am not prepared to say.

Dr. Charles P. Noble, in an exhaustive article, reports 805 cases by American operators in which fifty-six afterwards became pregnant and only six aborted. Complications at labor were as follows: Forceps delivery, three; Porro operation, one; retained placenta, two; uncontrollable vomiting (labor induced), one. He draws the following deductions: "1, That women subjected to this operation are less apt than others to become pregnant; 2, that pregnancy and labor, as a rule, are uncomplicated; 3, that uterine inertia is not infrequently met with; 4, that serious or insuperable obstruction to labor may be produced if the fundus and anterior wall of the uterus are imprisoned below the point of attachment between the uterus and abdominal wall." These conclusions certainly speak for themselves and need no comment.

There are various methods by as many different operators of performing ventro-suspension. Some use buried sutures, others use through and through removable sutures, and still others use so-called living sutures. Probably the best and most satisfactory operation is that advocated by Dr. Kelley, but slightly modified, in which, after the preliminary work, the uterus is suspended from the peritoneum by two chromicized catgut sutures which pass through the uterine muscle just posterior to the crest of the fundus. The mortality from this operation is practically *nil*, as it is by far the simplest abdominal operation performed. Upon examining the woman a year or so after the operation, if it has been properly done, "the uterus will be found lying in easy anteflexion with its posterior surface three to five centimeters distant from the anterior abdominal wall."

Operations on the Round Ligaments. Alexander's operation is also a suspensory operation, the round ligaments being used to hold the uterus in a permanent anteverted position. The round ligaments normally are simply guy ropes preventing too much backward movement of the uterus, and are in no way suspensory until the uterus has become prolapsed. Alexander's operation is becoming more popular every day as operators become acquainted with its advantages. The indication for this operation is clearly defined: a pathologically retro-displaced

uterus which is not adherent, and in which there are no complications, such as a tumor of the uterus, or adhesion and inflammation of the uterine appendages. The operation should be performed as recommended by Edebohls, who has probably practiced it oftener than any other operator in this country. Some of the disadvantages of Alexander's operation are: the difficulty of finding and isolating the round ligaments; the inequality and possible friability of the ligaments; and two incisions—thus a double liability to hernia.

The round ligaments are also shortened by intra-abdominal operations which were devised by Wiley and Dudley; both of these operations consist in making a median incision. The round ligaments are found within the abdominal cavity and folded upon themselves and held in this position by suitable sutures. Neither have any advantage over either of the above mentioned operations.

Vaginal Fixation. This operation should be mentioned only to be condemned. It is impracticable, it is difficult to perform, and it puts the uterus in an unnatural position. It is an operation which has been done frequently abroad, but in this country has not met with much favor.

Aubean's and Pryor's operation, as mentioned previously, consists in opening through Douglas' pouch, breaking up adhesions and replacing the uterus. Gauze packing is introduced below and back of the uterus; this remains in *situ* for several days, when it is removed. New adhesions form posteriorly to the cervix, thus holding the cervix up and tilting the body forward. This operation may be of value in some cases, especially where the abdominal operation is objected to on account of the resulting scar; otherwise the operation of ventro-suspension or Alexander's operation should be performed, according to indications.

(c) *Obstetric Lacerations of the Vagina and Perineum.*

BY W. A. KICKLAND, B. S., M. D., FORT COLLINS.

I am much pleased that this subject of obstetric lacerations has come up for the consideration of this society, and I have been highly interested in the papers read here to-day.

To the country practitioner, who has, perhaps, not over a dozen lacerated perinei a year for secondary operation, the technique of repairing the perineum is in a somewhat confused state. Particularly is this so in cases of old lacerations. In recent cases the damage is usually apparent, and if at once repaired the result is all that can be desired. But in old cases which have existed for years the situation is quite different. The cicatricial tissue which was so distinct has taken on the characteristics of the surrounding tissue, so that the line of laceration is lost. The effort of nature towards a readjustment has so changed the relation of parts that their former normal relations are difficult to find. A rectocele, cystocele, and prolapsed or retroverted uterus are easily recognized, but the position of the ends of the sphincter ani muscle, or how much of the levator ani, with its fascia, has been torn, and how many of its fibers atrophied, or how many can be found and brought together, and on which side of the median line the laceration originally extended, are questions that require some skill in diagnosis.

Is there a perineal body, so-called, and do we restore it in our operation on the perineum? Is not the mental and cosmetic effect on the patient of more value in most of the operations on the female perineum, as they are performed, than the real value caused by restoring the parts to their normal relations?

While in Chicago last year I was much interested in seeing the many different methods used by the different operators for the same pathological conditions. One operator lauded the Tait operation and explained its many advantages. Another would do the so-called butterfly denudation of Emmet and would explain how the laceration is always at the sides and that the levator ani is the essential muscle. He would show, on a nulliparous woman, that there is no perineal body originally and consequently none to be restored. Another would begin as in the Tait operation, and by folding the mucous membrane on itself and stitching several times would build up the perineum, and show by measurement that it corresponded exactly with the perineal body normally present in the virgin. Another combined the operation of Tait and Hegar by splitting up the flap,

and, beginning at the apex of the triangle, stitched back and forth, transversely to the body of the patient, with catgut, bringing the torn ends of the muscle together and leaving the wound protected by the flap.

Which of the operations is right, or are any or all of them? Is the condition found in a lacerated female perineum a constant one, or do these views arise from variation in the pathology? The anatomy of the female perineum is fairly constant. The presentation, in 95 per cent. of the cases, is the same; and with these fixed conditions, and from the examination of a number of recent cases, it has seemed to me that the location of the laceration is nearly enough a constant one to make some of the operations right in most of the cases, reserving the other methods for special conditions. It is not necessary for me to go into the anatomy of the perineum in detail. The levator ani, with its superior and inferior fascia, is attached to the pubis and white line, and forms a horseshoe-shaped cradle in which the pelvic organs are swung. Below this the sphincter vaginae from the pubis, deep and superficial transverse perinei muscles from the tuber ischii, and the sphincter ani from the coccyx, all unite in the central tendon of the perineum to form the perineal body, so-called. This central tendon is the point of greatest motion with the pubis fixed exactly opposite. This is the point of greatest friction in the first or second cephalic position, sliding over the irregular surface of the brow, nose and chin. It is the least elastic movable point and the one which yields first in the soft structures usually.

When the laceration is in the vaginal wall is it on one or both sides or in the posterior line? So far as I have been able to observe it is always on one side, that side being the one over which the face traveled in its descent through the canal. In some cases the perineal structures are more elastic and the tear is wholly intravaginal, and in these cases the levator ani, with its fascia, is the only muscle that suffers. In other cases the tearing is almost wholly external, and the perinuem is lacerated while the levator ani escapes.

After labor we find three forms of laceration: The first, in which the mucous membrane or skin only is torn; the second, in

which the laceration extends through the skin, mucous membrane, and muscles and fascia; and the third, in which there is the tearing of the muscles and fascia without the skin or mucous membrane being torn. This second form may be again divided into complete, in which the laceration extends into the bowel, and incomplete, in which the rectal mucous membrane is not injured. Of the first two forms we may have all degrees of severity, from a mere abrasion of the mucous membrane to a tear extending three or four inches up the bowel.

At the vaginal outlet the perineal laceration is nearly always in the median line. This laceration follows the median line for about an inch into the vagina, where it changes its course to one side or the other, continuing for a variable distance, sometimes to the vault. The vaginal tears are usually in a longitudinal direction, especially in cases in which there *is* an accompanying tear of the perineum. In cases in which the perineum remains intact the tear may be transverse or *in an* irregular direction. These internal lacerations, with no lacerations externally, should always be carefully watched for, as it is in these cases that we have a tearing of the levator ani muscle and fascia, followed by retroversion of the uterus and prolapse of the ovaries with the accompanying symptoms, while the practitioner is at a loss to know why these disastrous results have occurred in a case in which there was so little evident injury at the time of confinement.

Of these forms of laceration the first and second should be repaired immediately; that is, within six hours after the child is delivered; and if this is done the work of the gynaecologist would be greatly diminished and the need of secondary operations greatly lessened. There is a class of cases, however, not often mentioned by writers on this subject, which seems to me to demand more attention. I refer to those cases in which there *is* a tearing or excessive stretching of the levator and perinei muscles with their fascia, without a corresponding laceration of the skin or mucous membrane. That such cases do occur I am firmly convinced, but as to the treatment of these cases I am not quite so clear. They are difficult to diagnose at the time of labor, and it is only after the patient is on her feet and we have a prolapse

of the pelvic viscera that we realize a laceration has occurred. Shall we risk a mistake in diagnosis and increase the dangers of infection by cutting down on suspected cases at the time of confinement, looking for the torn ends of the muscle and trying to suture them? So far, in these cases where there is no external wound, I have waited developments and done the secondary operation when necessary. This I believe to be the safer plan, although I was unfortunate enough to have one of these cases fall into the hands of a brother practitioner, and my reputation suffered accordingly. However, in cases in which there is no surface tearing, I shall continue to wait until the patient has recovered from the immediate effects of confinement and the full effect of the injury is manifest. But with the best of care in the hands of the most able practitioners, and in 25 per cent. of the cases of the careless and incompetent, there remains a condition of laceration which must be repaired or there follows a train of symptoms which we all recognize as due to prolapse and change in the normal relations of the pelvic viscera. When this condition exists how shall we operate? In a paper read before the American Medical Association last June, Dr. Byron Robinson considers carefully the anatomy of the pelvis and perineum, and, after discussing indications, symptoms and results, recommends either the Tait or Emmet operation. I have studied his paper carefully, but have, as yet, been unable to determine how he reconciles the two to all classes of cases. In the American Text-Book for 1896, Emmet's operation is described as the one to use. In the edition for 1898, Hegar's operation is given the preference. As this is the method which I use, and as this seems to me to correct best the existing pathological conditions, I shall describe the operation somewhat in detail.

After the preliminary preparation—curetting the uterus if there is a discharge from it, amputating the cervix if it is long and conical or repairing it if lacerated—the patient is anaesthetized and drawn to the edge of the table in the lithotomy position and the legs held by assistants. The vulva is scrubbed with soap and water and the hair removed. The vagina is next scrubbed with green soap and water, working well up behind the cervix and in all the folds with a soft brush or absorbent cotton. The vagina and the surrounding field is then irrigated

with bichloride, 1 to 4,000. A piece of coarse silk twenty inches long is passed through the edge of each labium minore, the needle removed and the ends of each thread tied together, forming a loop on each side which is used for a retractor. The assistant holding the legs can hold these loops and there is nothing in the way of the operator. By allowing the labia to come together the torn edges of the fourchette shows the beginning of the laceration. At this point, on either side, a slight cut is made with scissors and these cuts are joined posteriorly by cutting around just at the muco-cutaneous junction. The forefinger of the left hand is then inserted into the rectum and the recto-vaginal septum drawn down as far as it will come easily, and a cut made in the mucous membrane in the median line at this point. With the cuts formerly described as a base and this last cut as the apex of a triangle, this surface is rapidly denuded by an assistant catching up the mucous membrane with mouse-toothed forceps, and the operator cutting under the forceps with scissors curved on the flat, taking the membrane off in strips. Usually I connect the apex with the two base angles first, as it is then easier to denude the triangle marked out than to be careful not to go beyond the boundary and make an irregular outline. The bleeding is slight; very rarely is an artery cut large enough to demand a ligature. The denudation must be carefully and completely done, as any islands of membrane left will form a secreting surface and prevent healing. When the denudation is completed a delay of a few minutes is necessary to control the bleeding, which delay may be shortened by the use of hot water (120°). We now have a denuded triangular surface, with a base two to four inches in length and an altitude of two to four inches. A sound is introduced into the vagina to the apex of the triangle and pressure made toward the rectum, bringing the two sides of the triangle together.

A one and one-half inch half curved Hagedorn needle is threaded with No. 2 sterilized catgut and the first row of sutures introduced. This is done, beginning three-fourths of an inch from the apex and one-half inch above the sound, passing the suture down through the tissues and around the sound, emerging at the opposite side. The end of the suture is made fast by tieing and the suturing continued toward the vulva. The needle

is introduced each time one-half inch anterior to the sound, passed down around the sound, emerging at a point opposite. The cut is cleared of blood-clots each time and the sound drawn down out of the ligature just before it is drawn tight. The running suture is continued to within one-half inch of the skin and the end of the catgut fastened. The sound by this time, having been entirely withdrawn, is re-introduced and the operation repeated. Usually two rows of catgut are sufficient to close the wound to within one-half inch of the sides of the triangle. A running suture of paraffined silk closes the remaining space in the mucous membrane, but in this the silk is carried not quite to the catgut, so that if there is any infection along the silk it will not be carried to the deeper ligatures.

There now remain the ends of the sphincter ani and the skin to be sutured. The ends of the sphincter ani are caught up and sutured separately with chromacized catgut No. 3. Three or four sutures of silk close the skin surface. The wound is dusted with sterilized iodoform powder and a piece of 10 per cent. iodoform gauze placed over the line of suturing. A small pad of sterilized cotton is placed over the perineum and a T-bandage applied. The legs are tied together and the patient put to bed. The urine is drawn with a catheter for two days and the bowels moved on the fourth day.

The vaginal stitches are removed on the sixth day by using a Sims elevator to expose them. The perineal sutures are removed on the tenth to the twelfth day, when the wound should be healed.

This operation is simple, easy to execute, and in the few cases which have fallen into my hands I have been able to use it with most excellent results.

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6. NOTES ON LACERATIONS OF THE UTERUS, VAGINA, AND PERINEUM.

BY T. MITCHELL BURNS, M. D., DENVER.

If our civilized women worked out of doors and in the sun and our fetal heads did not enlarge as we become more intellectual, this subject would be of little importance.

Among savage races lacerations are less frequent, and, when they do occur, heal more kindly because of the healthy circulation and the normal tissue tone.

Lacerations of the body of the uterus will not be considered in this paper.

Lacerations of the Cervix: As unequal pressure upon any stretching object tends to produce a laceration more rapidly, unequal pressure on the cervix, caused by the head after the rupture of the membranes, the forceps, or by the finger introduced between the cervix and the head, should be guarded against.

The majority of lacerations of the cervix are healed by nature, but it is very probable, or better a fact, that many of the displacements which have been attributed to prolapses due to lacerations of the perineum were due to a cicatricial parametritis, the result of an extensive laceration of the cervix.

I have cured a case of retrodisplacement following labor by massaging the cicatrized tissues involving the cervix, broad ligament, and vagina. In this case the laceration of the cervix was very extensive and involved the left lateral wall of the vagina for about two inches.

I have seen extensive lacerations of the cervix heal to such an extent that subsequent diagnosis of the previous extensive lacerations was almost impossible.

Lacerations of the cervix do not require immediate repair unless there be severe otherwise uncontrollable hemorrhage.

It would probably be better if all severe lacerations were repaired immediately, provided the patient is not too weak and the operator is gifted with dexterity in this operation.

If in every pregnant uterus there were a large amount of liquor amnii, there would be few cases of bad lacerations of the cervix in non-operative cases.

A large bag of waters not only dilates the cervix more evenly (through its hydrastic action) than does the uneven head, but it causes pressure upon the veins in the region of the cervix during the latter part of pregnancy and during labor, which increases the serous infiltration of the cervix and therefore its distensibility. I have seen the cervix of a primigravida dilated

three fingers two weeks before labor, and I think this is not infrequent in multigravidae who have a large amount of liquor amnii. How the liquor amnii can be normally increased is at present an unanswerable question.

Preventing patients from bearing down in the first stage of normal labors tends to greatly lessen the frequency of cervical lacerations.

Lacerations of the Perineum and Lower Vagina: The frequency of lacerations of the perineum varies greatly, and depends largely upon the class of patients attended and, to less extent, upon the attending obstetrician.

The more the patients resemble the semi-civilized in physique the less the frequency of lacerations.

It is a positive fact that severe lacerations occur more frequently among civilized women when they are delivered by nature than when nature is assisted by a skilled obstetrician.

It is probably also a fact that unskilled interference makes the frequency greater than in the cases left to nature.

For comparison, it is well to consider that lacerations of the perineum occur in one out of three primiparae, and in one out of ten multiparae when attended by an obstetrician.

The use of the forceps is considered by many to greatly increase the dangers of lacerations of the perineum, but, by keeping the blades attached until after the head is expelled, even in primiparae tears should be rare.

Lacerations of the perineum and vagina are often difficult of diagnosis without the introduction of the finger into the rectum, or at least the separation of the vulvar lips and careful inspection. In multiparae sometimes the separation of an old cicatrized laceration can only be diagnosed after an extremely careful examination.

The slower the head makes its exit the less the perineum is touched; the more the flexion and the more elastic the perineum, the less the frequency of lacerations.

I at present use a simple method of preserving the perineum which requires little skill and trouble and, while better for multiparae, is good for primiparae.

The patient lying on her back is permitted to bear down until the vulva is half or two-thirds dilated, according to the

rapidity of the progress. After this, bearing down is prevented by not allowing the patient to grasp or press against anything, and by asking her to say Oh! Oh! continuously during each pain. If necessary the descent of the head is retarded by the examining hand, which is so placed that the tips of the fingers are just in front of the perineum and their palmar surface in contact with the presenting part. The hand thus forms a continuation of the perineal trough and therefore lessens the pressure upon the perineum, causes the head to continue in the curve of Carus, and, by pressing upon the frontal end of the head, increases flexion and retards descent, and hence greatly lessens the dangers of lacerations.

Chloroform should be used if the patient is a primipara or one who suffers severely.

Care should be used to make the progress especially steady as the nose and chin are passing the fourchette, and the perineum should be preserved with nearly as much care when the shoulder is passing as when the head is passing.

Lacerations of the lower vagina and perineum should be repaired at once if the laceration is large enough to get a suture around it. If this rule is not followed the tendency is to become more and more careless. Larger and larger tears will be left to nature and cases of infection and prolapsus will follow.

All lacerations call for the antiseptic vaginal and vulvar douche, liberal iodoform dusting, and sterilized antiseptic pads.

The sutures should be silk-worm gut sterilized by boiling, as no other sutures give as good results.

They should be introduced far enough away from the margin of the cut to allow of a firm hold, and they should emerge at the center of the cut and re-enter to cause perfect coaptation of the wound.

Fastening the knees together after repair of the perineum is unnecessary, and may be harmful through the worry or vaginal retention of the lochia which may follow.

To prevent the possibility of the sutures tearing out through the passage of hardened feces, it is best to give an enema whenever the bowels feel as if they are about to move, and to begin the use of a saline cathartic on the third day.

DISCUSSION OF SYMPOSIUM ON LACERATIONS OF THE UTERUS, VAGINA, AND PERINEUM.

Dr. H. B. Whitney—I want to say just a word about the method of procedure for protection of the perineum which was pursued exclusively at the hospital in Vienna, and which has given me most excellent results in my practice since. I can recall only two ruptures of the perineum that I have had to sew up in a practice of fifteen years, which, though not large, has of course included a very considerable number of cases. As soon as the vulva has dilated to the size perhaps of a dollar or a little larger the patient is made to lie on the left side with the knees drawn up; then the left hand of the operator, who sits by the side of the bed, is passed around between the limbs of the patient and, clasping with the right, in that way is prepared to hold back the head as soon as it begins to descend too rapidly. That is all there is to supporting the perineum. There is no such thing as an actual support of the perineum, but there is such a thing as holding back the head and thus causing it to emerge slowly and thus effect a gradual dilatation. Meanwhile the perineum itself is kept very clean by constant washing with a small piece of cloth dipped in bichloride solution. A second important feature of the method is to carefully follow the progress of dilatation, and by means of the finger hooked under its free margin one can tell, after a little experience, whether the perineum is liable to rupture or not. As soon as there seems to be the slightest evidence of possible rupture episiotomy is done. No obstetrician in Vienna, or even a midwife, would ever think of attempting a case of labor without an episiotomy knife at hand. It is always my custom to prepare my knife as a matter of routine in the same way as I prepare my hands; and I can say that I have done that little operation a great many times with the result as stated—that only twice, as I recall, have I had to sew a perineum, and one of these was after the use of forceps. The episiotomy does not produce pain. It consists in a very slight cut on each side, which, of course, simply prevents rupture in the median line. Once when doing it in the presence of another physician he asked me why I did not cut in the middle—a man

who had had a great deal of experience, too—and the very question shows how little the principle of episiotomy was understood; because if the cut is made in the median line a further rupture will certainly take place at that point, whereas if the cut is at the sides and perpendicular to the fibres of the sphincter the tear will extend no further. I have never seen the further extension of such a cut. I merely want to call the attention of the society to this little operation, which is so simple, so easily done, so painless, and which I think is of extreme importance in the prevention of laceration in those cases where careful observation shows that laceration is likely to occur.

Dr. W. W. Grant—I would like to say a word in regard to the interesting papers which have been read. First, I think the gynecologists are disposed to lay too much stress upon the fact that so many of these patients being neurasthenic the neurasthenia must be due to pelvic disease. Now nothing is further from the truth than such a belief. These women with lacerated cervices are not necessarily neurasthenic, while many of them are. They can not be cured except by a distinct investigation of the entire organism. The sewing up of every laceration should be done, although all neurasthenic women will probably not get well until a definite lesion has been repaired. As to what we should do in fresh lacerations I think there should not be much difference of opinion; that whenever there is hemorrhage, especially, and, according to a growing opinion, in every case of decided lesion, the cervix should be repaired at once. In doing so the patient gets well as soon as she ordinarily would from the puerperal period. Then there is another reason, and that is the distinct relation that these lacerations, if not repaired at some early day, bear to carcinoma of the cervix. We do know that when carcinoma occurs in child-bearing women traumatism is a definite predisposing cause of the carcinoma. Now if it is not repaired at once it should be done certainly before the climacteric has been passed. In this way, by sewing up the cervix, we may save a great many of these women from cancer, and, consequently, curtail the mortality which is now very great in all countries from this cause. Any woman who goes through life with a lacerated cervix is in constant danger from infection due

to this condition producing cancer. Whether it is due directly to a parasite or not is not now definitely known. But we do know the direct relation of traumatism to it. We know that that tissue is most unhealthy. We have a condition that directly invites infection, and the only way in which this condition can be remedied is by repairing the laceration—and it is not a dangerous operation; even should you perform it upon some woman who would never have cancer, you have lost nothing but gained much. You have relieved the apprehension of the surgeon or physician, and you have undoubtedly saved many of these women from a premature grave, due to carcinoma.

Dr. R. W. Corwin—My friend, Dr. Hawes, for whom I have a great deal of respect, whom I have known many years, whom I know to be a pure and upright man, and whom I do not think believes all he states in the paper he has just read because I have known him to defend the opposite side, handed me his paper a few minutes before he read it. When I returned it he said: "What do you think of it?" I answered: "It is very well written, but I do not agree with you." The doctor remarked: "Pitch into me then." I do not wish to be understood as pitching into Dr. Hawes, but, with all due respect for the reader of the paper, I wish to say I totally and absolutely disagree with the sentiments expressed in the paper.

If I understood correctly, the doctor contends that the female reproductive organs should be restored to their normal conditions in order that conjugal love may most perfectly exist between husband and wife. How with the widow? Are there not other reasons for restoring these organs? These organs should be repaired to relieve suffering and prevent diseases, without regard to sexual pleasure.

That part of the paper I wish especially to attack which intimates that love and passion are synonymous; that passion, or the satisfying of it, is essential in the happy home; that it creates love and respect and brings children into the home circle at times most auspicious.

Passion destroys love, respect, and manhood. It makes a man worse than a brute and woman a slave. It causes children to be born when not desired and when they can not be sup-

ported. The beasts of the field or the dog on the street have more liberty than the wife. Tell me of a dumb animal that approaches its mate unsolicited! Show me a creature below man unless it be the ape which man imitates, that does not select its time for having young! The human female is not treated with the deference of the beast of burden or the creeping reptile.

Physicians take a very wrong position when they teach the youth that his sexual passion must be appeased. This mistake leads to dissipation, dissipation to disease, disease stores seeds later to be deposited, perhaps, in the innocent girl. These germs account for 50 per cent., we are told, of abdominal operations performed for the removal of ovaries and tubes.

Do you mean to say that your aged father and mother did not live happily and sweetly together?

What would become of conjugal relations in cases of injury and sickness? You may as well declare that a mother can not love her child. If happiness is to exist between husband and wife, conjugal love must find its source far above that of the animal.

I say, gentlemen, the teachings, in this respect, that come from our profession are most damnable from beginning to end. None can appreciate the position until it is brought home. Let me ask if there be one here who is willing to give his sister or daughter over to the mercies of a being worse than a brute.

Dr. T. E. Taylor—I would like to add a word to what was said in regard to the prevention of lacerations. I think we will all agree that the prevention is much more important than the cure. The methods of repair have been very well stated, but I think there is still something to be said in regard to the methods of prevention. Dr. Whitney's plan of preventing the descent of the head is one of the factors, as it seems to me, but not the only one; and Dr. Burns' plan of having his patient say "Oh!" is in the right direction, but at the same time is too feeble as a remedy for those cases of rapid descent. I think that our most important remedy here is chloroform, not used, as we perhaps may use it during the greater part of labor, simply to relieve the pain of the mother, but pushed to the surgical extent, if necessary, so as to almost entirely remove or suspend the uterine contrac-

tions. Under these circumstances we get time for the perineum to distend. We can, perhaps, when the head is almost ready to pass over the perineum, deliver it mechanically ourselves with far less risk of laceration than if it was crowded down rapidly by the patient's own pains. I think the chloroform is equally as valuable as any manual impediment which we can make for resistance to the descent of the child.

Dr. H. G. Wetherill—I congratulate the society and the gentlemen who have taken part in this symposium upon the good which I think it has done. It seems to have considered the subject from almost every standpoint.

Dr. Corwin would have given us an elaborate classification of his portion of the subject if he had given us nothing but the valuable charts which are in front of us. There is one thing, however, to which these charts do not sufficiently allude and which, in my opinion, is not sufficiently emphasized; that is, we have not yet shaken ourselves free from the old idea that a laceration of the perineum is the important thing obstetrically. Dr. Whitney, I think, falls somewhat into this error. An episiotomy might prevent a laceration of the perineum, but not of the muscles and fasciae inside the vagina upon which the tonicity of the vagina and the position of the pelvic organs depend. The laceration to which the gynecologist must give attention is the laceration in the sulcus of the vagina, of which Dr. Jayne has spoken. If I might use Dr. Corwin's illustration, I would like to emphasize what he has already called attention to, that lacerations through the median line at the junction of the muscles are not the lacerations that do the harm. The laceration which does do harm is the vaginal tear; that which tears the levator ani muscles on either side. It has taken the profession a long time to grasp this old idea which Emmet gave us years and years ago.

Dr. J. Hawes—I made some mental comments as the different papers were being read. One of the comments related to a remark made by Dr. Kahn concerning the introduction of a needle into the perineum. He assured us, as I have been assured a great many times in my life by others, that there was almost no sensation whatever from the introduction of the needle through the torn perineum. Now, my observations have been somewhat

extended and I have arrived at a very different conclusion. I will guarantee he never suffered from a lacerated perineum on his own person and never had it sewed up. If he had he would tell us *it hurt*. I notice that the most of my patients, when I introduce a needle through the perineum, get out of the position I want them to remain in, and it is utterly impossible for them to remain as I want them to do until I can get that laceration sewed up. I give chloroform in probably four-fifths, perhaps nine-tenths, of all the obstetric cases that I attend, and I don't think that my patients were ever any worse for my administering to them chloroform after the labor for a few minutes while it was necessary for me to sew up the perineum. Certainly when I have introduced my needle into the perineum of the patient under an anaesthetic I have taken my time to examine the extent of the wound carefully in order that I might know the full extent of the injuries that had occurred, and am able to do so without any pain to the patient; an anaesthetic enables the physician to do better work.

Concerning a remark of Dr. Whitney's in regard to preventing laceration of the perineum—his suggestion is very excellent, but I have been accustomed, as soon as I found the head was quite soon to be carried over the perineum, to introduce a small pair of forceps to hold the head back until the perineum could be slowly, safely dilated; many perineums will stretch in fifteen minutes without tearing which in a one-minute passage of the head would tear without stretching. I can make the little stranger come along just as slow as I wish to and have much more control of his progress by the use of the forceps than I can if I simply depend upon the hand placed under the perineum and "supporting the perineum."

Now, I am much obliged to my friend Corwin for having brought out one point which I think perhaps he did not intend to bring out. In defining what conjugal love was I quoted from an author whose authority I very much respect. He defines it as "an animal instinct heightened by imagination and modified by reason." Not an animal instinct turned loose, not an animal instinct and nothing else, but "an animal instinct heightened by imagination and modified by reason." One would suppose from

listening to the remarks of my friend that he had simply glanced at the words "animal instinct" and supposed that they were synonymous with sexual passion. It is only a part of it. A man might as well deny his grandfather or grandmother because they have lost their teeth and hair as to deny that they ever were under the influence of sexuality. This is not a synonym of sensuality, because in the fullness of time this one component part of conjugal love—sexuality—has largely subsided.

Dr. T. M. Burns—When I hear physicians state that they do not have cases of laceration of the perineum I am led to believe that they do not examine carefully. I wish they would let me examine three of their primiparae cases in succession; I believe I could demonstrate that they do have lacerated perineums. Of course, if they make an incision on either side large enough, as large as the laceration would be, then there is no necessity for a laceration. I give chloroform in order to repair the perineum, for one reason that I can not stand the suffering the patient has. Now I do not know whether it hurts the patient or not, but it hurts me when they scream so, and I will not repair a perineum unless they allow me to give chloroform.

Dr. I. B. Perkins—There is one point that I have not heard mentioned this afternoon in regard to supporting the perineum which a friend of mine noticed accidentally. He told me about it, and I have used it several times with good results. It is especially applicable when forceps are being used. The assistant takes a dry towel and passes it beneath the forceps, across the perineum, and holds it by its ends, facing the operator, and as the operator draws on the forceps the assistant makes traction on the towel. The towel should be perfectly dry because, as a rule, the perineum is moist at that time. If one is trying to support the perineum with the hand, the hand slips more or less. But the dry towel seems to have just friction enough to hold it steady, prevent slipping, and give considerable support. I have seen a number of cases where I thought it impossible to deliver without tearing the perineum, and by this method there was no tearing whatever.

I fail to see how one can repair a very extensive laceration of the perineum, especially where it extends up the sulci, with-

out using an anaesthetic. I believe in those cases it is more necessary to suture well the floor of the pelvis and any tears inside of the vagina than it is the external tissues.

Dr. Sol G. Kahn—I was out during the greater part of the time of the reading of the papers and the discussion, and I just came in in time to hear Dr. Hawes state that he thought my perineum had never been repaired, or something of that kind. No doubt he has seen more lacerated perinei than I have. The administration of chloroform in repairing lacerated perinei is certainly preferable; but if you are alone, a long way from any assistance, and having given the patient more or less chloroform during labor, it is not, in my opinion, advisable to ask some kind neighbor who happens to be in to give the anaesthetic. The pain connected with sewing up a lacerated perineum immediately after labor is not nearly as great as under any other circumstances. That has been my experience, and I have sewed up quite a number. I have not sewed them up by the thousands, but I have sewed up all I have come in contact with and I have been able to sew them up without an anaesthetic. If forceps have been used and I had assistance at hand, why, I would always give chloroform; but when it has not been possible to give the chloroform I have been able to sew up lacerated perinei without it, and it did not give me very much pain either.

CHOLERA INFANTUM.

BY M. McNEELAN, M. D., BASALT.

It is the object of this paper to deal only with those cases which have choleric symptoms. As compared with other forms of diarrhoea it is quite rare. The relation is so close between this and other diarrhoeal affections that I shall be compelled to speak of them in their relation to each other.

Etiology—There seems to be no doubt that the disease is produced by a specific micro-organism introduced into the alimentary canal from food or other sources, although other fac-

tors may play an important part in the development of the trouble. In fact, it is usually preceded by a dyspeptic diarrhoea, a gastro-enteritis, or may supervene in an entero-colitis. Any of these troubles may lower the vitality and thus enable the specific germ to attack the tissues whose resisting power is below normal. There are many other factors, such as improper food and bad hygiene and sanitation, which favor the development of the trouble. In fact, the exciting cause usually can be traced to the ingestion of improper food, usually milk. It very rarely occurs in children who are nursed by healthy mothers.

Pathology—The mucous membrane of the entire alimentary canal has a pale, "worked-out" appearance. If the disease has been engrafted on some of the other forms of diarrhoea, the pathological changes characteristic of them may be present. The lesions are found in the superficial epithelium of the stomach and intestines. There is no constant change present in the brain or spinal cord.

Symptoms—These occasionally occur suddenly in children who have been previously healthy, but this is exceptional. Usually there are prodromal symptoms, such as dyspeptic diarrhoea or a sub-acute entero-colitis. Choleriform symptoms when once established develop very rapidly. There may be other prodromal symptoms, as restlessness, rise of temperature, and general prostration, or vomiting and purging may commence suddenly. The vomiting may precede diarrhoea, but in my experience this has been exceptional and when it does occur it indicates a very severe attack. The vomiting is usually incessant, and consists first of food taken, then serous, mucous, and finally bilious matter. It may subside only to be renewed on taking food or drink.

The stools are large, frequent, and watery, of a pale green, yellow, or brown at first; but as they become more frequent they are almost entirely serous. They are acid at first, then become neutral, and when serous are usually alkaline. There is usually an absence of the offensive odor of the stools which we get in the acid diarrhoeas. Prostration is great from the outset. The sunken eyes, the pallid face, and the general expression of

distress all indicate the gravity of the disease. In the early stage the child will be peevish and restless, giving a peculiar whine or moan. Later, stupor, coma and convulsions may occur. The temperature is usually elevated in proportion to the gravity of the case. The surface of the body and the extremities may be cold, yet if the deep rectal temperature is taken it will be elevated. The pulse is always accelerated, growing weak and sometimes irregular as the disease advances. Respiration is irregular and frequent. The tongue is lightly coated, but soon becomes dry and red. There is always intense thirst. Fluids are taken with great avidity, only to be rejected by the stomach. In some cases the patient passes rapidly into a state of collapse, death ending the scene.

The disease seems to be self-limited, rarely lasting more than two days. It may last only a few hours. In fatal cases the temperature usually continues high, although the extremities are cold. In cases which pursue a more favorable course the symptoms gradually subside, but recovery is always slow, and death may occur from exhaustion or from some intervening cause.

Diagnosis—The diagnosis is very easy if we just keep the symptoms in mind. It can only be confused with gastro-enteritis and acute dyspeptic diarrhoea.

The prognosis is always grave. The more marked the symptoms the graver the prognosis.

Treatment—Much may be done in the way of prophylaxis. Under this I would include diet, hygiene, and medication. I believe that nearly every case of diarrhoea can be traced directly to some error of diet. Therefore we must pay the very strictest attention to the feeding of the child. If foods disagree we must select some food of known merit, and try very carefully one at a time until the proper one is found and then use it exclusively. The time of taking and the quantity taken should be carefully regulated. Many more children are over fed than under fed. The more care given to detail in feeding, the better success will we have. We should leave carefully written directions as to diet, and insist that they are carried out as strictly as those of medication. In certain cases it be-

comes necessary to withdraw all food for from twelve to twenty-four hours.

The proper ventilation, bathing, and clothing should receive attention. The child should neither be kept too hot nor too cold, and should have plenty of fresh air at all times. Those in cities should be sent to the country when possible. The clothing should always be flannel undergarments, and should be regulated in weight according to temperature of surroundings.

The first indication in prophylactic medication is the evacuation of the bowels, for which calomel or castor oil are the remedies. I prefer calomel in small doses at short intervals, as it controls vomiting and has good antiseptic effects. I like irrigation by the bowel with normal salt solution. At least a gallon should be used at a time, as it flushes the lower bowel and thus removes many of the products of decomposition. The temperature of the water must be regulated by the temperature of the patient.

The principle of antisepsis seems to be a correct one, but most so-called antiseptics have been disappointing. Salol and bismuth have held their own the best, and give the best results. Bismuth must be given in large doses to get the best results. Eudoxine, the new bismuth salt, has given good results. Opiates should be given carefully and sparingly. They may be given in the form of deodorized tincture, paregoric, or as Dovers powders.

Now as to treatment when the disease is fully developed. Since the symptoms vary so much the treatment must to a certain extent be symptomatic. The indications are the arrest of the discharges, maintenance of strength, the reducing of temperature, and the controlling of the nervous symptoms.

In the treatment of vomiting, small doses of calomel given dry at short intervals may give very good results. Morphine and atropine hypodermically, given carefully, usually give the very best of results, as they arrest vomiting and purging, allay nervous symptoms, and stimulate the circulation.

The so-called antepyretic drugs are worse than useless in controlling the temperature. The only reliable remedy is the bath, beginning at one hundred degrees, gradually reducing to

eighty degrees, and continuing from ten to thirty minutes. It should be repeated frequently enough to control the temperature. Cold cloths or the ice bag to the head and injections of cool, sterilized water are very useful. Stimulants are necessary to maintain strength. Iced champagne or brandy in small quantities at short intervals, strychnia, and digitalin hypodermically, are very useful. When the surface is cool and the rectal temperature is hot, apply heat to the surface and cool injections to the bowels. Since there can be no digestion, food is worse than useless and should be withheld. Even after vomiting and purging have been controlled, food should be given carefully and in small quantities. Peptonized milk and meat juices are tolerated best. Complications arising must be treated as such, and can not be dealt with here.

TRACTION PLASTERS FOR TEMPORARILY CONTRACTING AN AFFECTED LUNG, IN LIEU OF THE MURPHY OPERATION.

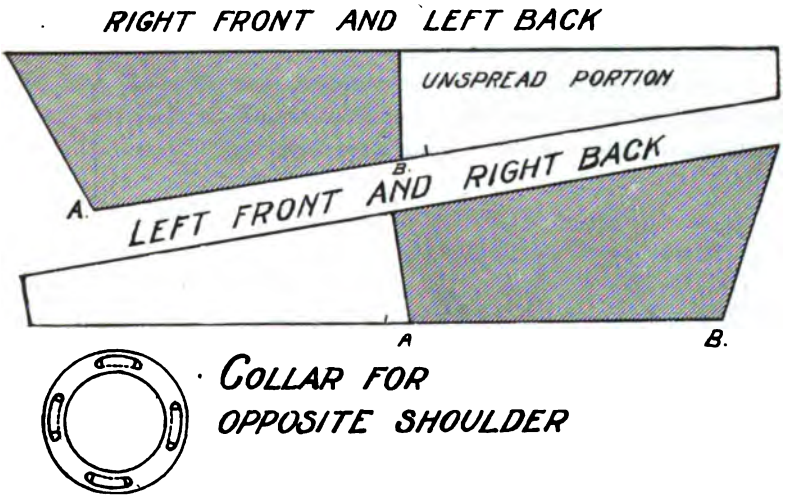
BY CHARLES DENISON, A. M., M. D., DENVER.

My object in presenting this paper is to offer and illustrate a better way than has heretofore been obtained to control thoracic movement on one side and confine respiration to the unaffected lung. This method is a perfectly evenly, and easily applied means to nearly annul the use of one lung, and therefore temporarily a suitable method to arrest pulmonary hemorrhages when from a known localized source; a way also to control ordinary or tubercular pleurisy, complicated or not with adhesions and pneumonia; or to limit and contract a pulmonary cavity especially if located low down in a lung. Here the descent of the diaphragm in breathing disturbs and over-distends a cavity and thus produces strain and rupture of implicated blood vessels.

Messrs. Seabury & Johnson of New York have succeeded in making for me the special form of plasters desired, and the following is an illustration of what we will call a set or pair. These traction plasters are made suitable for use on either half

of the thorax, and the collar is made to encircle the opposite shoulder.

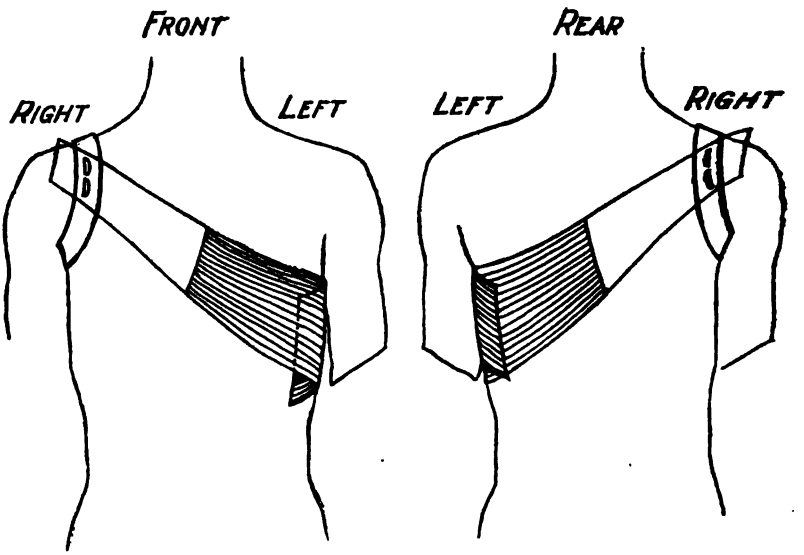
The plasters are spread on the attachable surfaces A to B. as shown in the cuts, of strong muslin so thick and firm that it



will not wrinkle on pulling. They are large and long enough to fit a good sized man, all requirements of smaller sizes being possible by paring these down to the required dimensions. The collar, too, can be cut and made smaller very easily. These traction plasters when applied, lapping over each other in the axillary region, completely encircle the side to be compressed. The source of power for traction being above and out of the way of the other lung, that one is left temporarily to do the respiratory work of both lungs. This in a good measure it does do according to the accompanying test measurements. Note the illustrations of the application of the plasters on a 15-year-old boy who has grown seven inches in a year, and therefore his chest can be assumed to be very flexible and yielding. His natural chest movements are: Circumference, 29½ and 33¾ inches, or 4¼ inches expansion, the right being 15½ and 17 inches and the left 15 and 16½, each side approximately 1½ inches. (My explanation of the usual inequality between the circumferential movement and that of the combined two sides measured sepa-

rately is that in the latter instance the skin may move and the measuring tape has a tendency to follow the upward movement of the underlying ribs.) Now with the plasters on the left side and drawn tight, this youth's measurements are: Total, 29½ and 31¾, or 2¼ inches; left, 15 and 15¼, and right 15½ minus and 17½ inches, or over 2 inches, showing conclusively that the work is thrown onto the unbound lung.

For comparison I chose a mature, fine chested, and hard working teacher of Swedish gymnastics and applied the plaster to the same side, the left. Total measurement, 33½ and 37; right,



16½ and 18½, equals 2; and left, 17½ and 18, equals ½ inch. Plasters off, total, 33½ and 38 inches; right, 16½ and 18½, equals 2; left, 16½ and 18¼, equals 1¾. Considering that the strength of expansion was so great in this trial that the safety pins gave way, the limiting power of the plasters when applied to an invalid will be easily comprehended. In fact the comfort of the patient will often have to be conserved by *not* pulling the plasters toward the collar as tightly as possible.

The most serviceable application of these traction plasters seems to me to be for the checking of pulmonary hemorrhages.

Only inferentially suggesting the damage possible where a mistake is made in the application of this method, due to wrong reasoning as to *where* a pulmonary hemorrhage comes from, I will say that, when rightly applied, no other plan, in my judgment, surpasses this one in the surety of result and the confidence given both the patient and physician. The application of this method is most suitable when the diagnosis unmistakably points to the usual engorgement of blood which Niemeyer, I believe, was the first to intelligently explain. (I never felt sure my students understood this till they could explain why and how the blood of a pulmonary hemorrhage is arterial [red blood] and not venous as in engorgement elsewhere.)

I wish to call attention to the frequency with which this engorgement and rupture occur in the left infra-clavicular space, and I will illustrate the good effect of the method of treatment by the following case:

In February, 1895, I was called in consultation by Dr. White of Trinidad, Colo., to see C. L. W., who had had repeated pulmonary hemorrhages occurring every two or three days for over two weeks. The recurrence was not checked by the usual astringent and anodyne treatment which had been properly administered, mostly by hypodermatic injections. The patient, a tall Virginian, who had come to Colorado eight years previously after four years of ill health (hemorrhages, etc.), was pretty thoroughly exhausted by the loss of blood and the apparent hopelessness of arresting the same. There was dullness on percussion, obstructed breathing, and moist rales on coughing in the left infra-clavicular space, and I concluded that the recurring hemorrhages came from a spot half way between the center of the clavicle and the left nipple. Evidently as soon as he could make enough blood to supply the previous loss and get strength enough to cough and clear out the congested spot, a reopening of the old source would occur and he would fall back, a little weaker perhaps than before.

The plan I had previously tried in similar cases was readily acquiesced in, namely:

Two strips of raw adhesive plaster, five by fourteen inches, were sewn end to end to similar strips of muslin, and a collar for

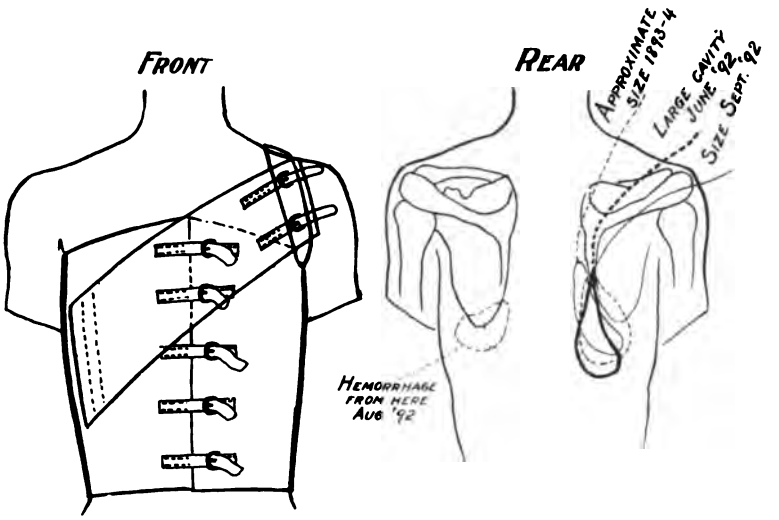
the right shoulder was made. The plasters were applied to the chest, crossing each other in the left axillary region, and the muslin, front and back, was tightly drawn and firmly pinned to the collar. The confidence which this support gave the patient augured success for the method, and the recovery was uneventful without any other treatment.

Another illustration of a more prolonged management of such a case where the hemorrhages were from a large excavation is summarized as follows:

Mr. M., July, 1892, age 33, a Kentuckian, who had been in Colorado seven years. Naturally of strong constitution and no inheritance to consumption, but very sick in childhood, "whooping cough, lung fever at times and bronchitis for twenty-nine years." Erysipelas nine years previous to date given. Came to New Mexico in 1876 from Kentucky; back and forth, east and west, his wayfaring life led to complications along in the nineties. In November, 1891, had grippe and then recurring hemorrhages; and in December was confined to bed and was three months in hospital with more hemorrhages and a profuse purulent bronchorrhoea. In March, 1892, went to San Antonio, Texas, but had hemorrhages there. On return to Denver was confined another month with constantly recurring hemorrhages on the least exertion, and was pretty well discouraged and unable to leave his bed when I first saw him in June, 1892. A large bronchiectatic cavity was found in right infra-scapular region reaching up into the inter-scapular space, and another small bronchiectatic spot similarly located in lower left inter-scapular region from which he bled in the following August. The hemorrhages from the right large cavity in May were, to me, explained by the strain produced in the descent of the diaphragm on deep breathing or coughing. The modus operandi of the mechanical means of relief depended on are easily understood on that basis. The hemorrhages were controlled without medication by the use, first, of plasters as described in the preceding case, then, later, by a jacket which was finally modified to a corset with straps and buckles (see cut), which he refused to go without for two years. Whenever any blood spitting occurred while out on the street he would step aside in an alley and pull up his straps and thus arrest it.

The second illustration shows the approximate size and location of the cavities and their change under the compression treatment. I ought to add that this is the same case as No. 2, reported to the American Medical Association meeting in 1898, in my paper on "The Modern Treatment of Tuberculosis," to whom were administered such large doses of crude tuberculin; for the case was tubercular, as proved by abundant tubercle bacilli found in his purulent expectoration.

The management of these cavity and bronchiectatic complications of lung disease necessarily introduces the consideration



of the question of intra-thoracic air pressures, a subject I have been much interested in.* Such a study naturally brings under discussion the operation elaborated and illustrated at the Denver meeting of the American Medical Association by Dr. J. B. Murphy of Chicago. This is to annul the action of the affected lung by injecting nitrous oxide gas into the adjoining pleural cavity.

As I am opposed to this method of procedure, because it seems to me to be an uncalled-for surgical operation, I will take this occasion to explain why the theory which actuates this inter-

*See "Abnormal Intra-Thoracic Air Pressures and Their Treatment," president's address, Denver meeting, September, 1890, of the American Climatological Association.

ference with nature's processes seems to me indefensible as a general postulate. At most it can only be defended as an exceptional advantage.

While it is true that a diseased lung, when acutely affected and painful, can be healed and treated better if it is rendered inactive, yet it is also true that the life of the lung is its activity, and unrelieved compression will soon annihilate the use of a given lung. This surgical operation, to be successful, should be based upon a more searching and thorough physical diagnosis than I suspect is generally made by physicians and surgeons. My own experience has proved to me that both lungs are affected in a much larger percentage of cases than generally believed, and this operation depends upon one lung being in a normal condition. The "putting to rest" of the diseased portion of a lung is to be obtained by the possible annihilation of the remainder of that lung. Nature's protective pleuritic adhesions and peripheral fibroid process, the evident purposes of which are to stiffen and support the affected portion, throw nearly all the contracting process possible to occur upon the unaffected portion operated on. This was the impression confirmed into a conviction by the first Murphy operation I saw performed in Chicago last summer. The sacrificed good lung may, *perhaps*, afterwards be redeemed to some use; but the risks are too great, and the main object of treatment, the elimination of tuberculosis, is ignored.

The teaching of a quarter of a century of experience on the part of the medical profession is controverted by the general acceptance, if it were possible, of this theory. If that medical experience cited has elicited and proved one thing more than another in our fight against pulmonary tuberculosis, it is that high altitude, exercise, and a proper method of inhaling, which, to my mind, involves *exhaling against pressure*, constitute the best means possible to limit this disease. Why? Because in curable cases these means open up to the inhaled, pure, or antiseptic air the affected lung areas which the proposed operation is intended to close. The operation is not without other dangers to the individual aside from the imprisonment in unventilated spaces of septic material; for instance, the shock to the system and the

liability of wounding the healthy lung in the procedure. In those cases where it is evidently required to "put to rest" temporarily a portion or the whole of the lung, the method I have described can be applied with much certainty of obtaining beneficial results.

The mechanical condition within the thorax needs to be recognized as one of *negative* pressure, i. e., it averages much more on that than on the side of *positive* air pressure. During inspiration it is decidedly negative, and only positive during expiration, voluntary exertion excluded. But with voluntary effort included, inspiration is even more *less positive* than is expiration, as shown by our usual ability to expel about twice as much force, recorded in millimeters of mercury by the manometer, as we can draw into the lungs by forced inspiration. The total physical state within the thorax is then *negative* throughout life, as stated by W. Einthoven and confirmed by W. N. Northrop, W. Gilman Thompson, the late Joseph O'Dwyer, and others.

This is most important—the chief—of all considerations to be kept in mind by the surgeon who undertakes to operate through the thoracic walls to reach any cavity or air space connected with the bronchial tract. It is undoubtedly the explanation of more than one sudden death, resulting from ill-advised effort to aspirate a bronchiectatic or other cavity within the lung.

The difficulties and dangers which this consideration imposes upon surgical interference with the respiratory organs, with their delicate vascular supply quickened commensurate to their small area compared with the many times greater area of the systemic system, were the incentives for devising, first, a rapid way to enter the chest wall by resection of a rib; and, second, a drainage tube which would control the ingress of air and so counteract this negative pressure. The rib cutter and the valvular drainage tube which I presented to the profession several years ago answer these purposes very nicely. The former gives ample power to one hand, after an inch and a half incision is made over a rib, to make a clean excision of one to three inches of a rib; and the immediate introduction of the latter, following puncture with a blunt instrument, is possible, so that no fearful aspiration inwards of the contents of a bronchiectatic cavity can occur.

In conclusion, it is evident that this negative pressure state within the thorax aids the permanent shrinkage process due to the fibroid tendency in most chronic lung cases, so that an irritative or inflammatory disease can be made to heal more readily by putting the part *to rest;* and this quiescence is undoubtedly produced by the gas injected and intended to remain in the adjoining pleural cavity. It remains to be determined by experience, however, if the undesired action of the affected lung can not be as well checked by the outward use of these traction plasters, while the undesirable and uncertain features of a complicated surgical procedure are avoided.

SYMPOSIUM ON GALL STONES.

1. ANATOMICAL CONSIDERATION OF THE REGION INVOLVED IN SURGICAL OPERATIONS UPON THE GALL BLADDER AND BILE DUCTS.

BY H. E. WARREN, M. D., DENVER.

The anatomical consideration of the region involved in surgical operations upon the gall bladder and bile ducts brings forward the following questions:

1. What is the relation of the structures in question to the periphery, and to the abdominal wall in particular?

2. What are the characteristics of the abdominal wall in this region?

3. What are the relations of the gall bladder and bile ducts to one another and to the surrounding parts?

1. The position of the gall bladder is nearly constant. Lying on the under surface of the liver, between the right and quadrate lobes (see Diagram A), its fundus projects slightly beyond the edge of the liver and approaches the abdominal wall opposite the ninth rib cartilage at the outer border of the right rectus muscle. (See Diagram B.) The neck of the gall bladder, assuming a double curve or S shape, passes backward, upward, and inward to the outer extremity of the transverse fissure of the liver, where it narrows into the cystic duct. The latter passes downward and joins the hepatic to form the common duct, which empties with the pancreatic into the second or descending portion of the duodenum at its posterior-internal aspect just below the level of the transverse process of the second lumbar vertebra. (See Diagrams A and D.) The common duct, after passing

behind the first part of the duodenum, lies within one-half inch to one inch of the median line. (See Diagram F.)

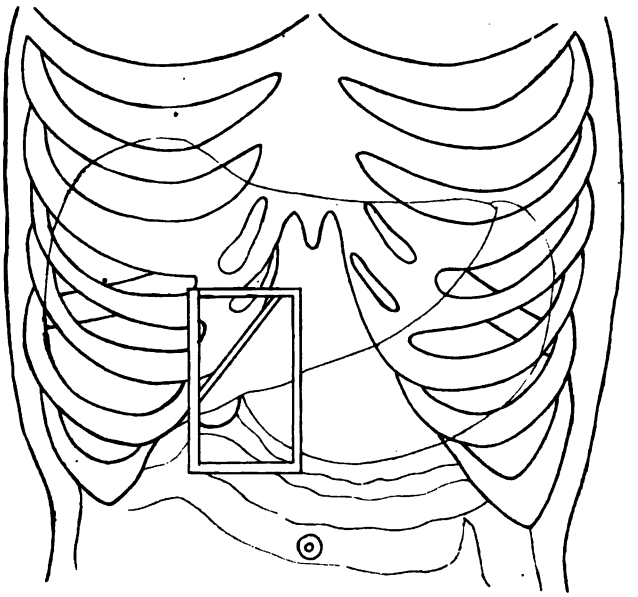
The point of origin of the cystic and hepatic ducts, the highest plane reached by these structures, is on a level with the ninth rib in the axillary line. (See Diagram A.) Surface lines passing at right angles through the points mentioned (horizontally, at the level of the ninth rib in the axillary line and just below the transverse process of the second lumbar vertebra, vertically, one-half inch from the median line and at the outer side of the fundus of the gall bladder) give the actual limits of the area oc-

cupied by the gall bladder and ducts. (See area enclosed by black lines in Diagram B.) The abdominal portion of this area through which the parts concerned may be approached is the same, excluding the upper outer portion cut off by the blue line. Any abnormal condition in this region, with or without pain and tenderness, or pain and tenderness alone, must suggest involvement of the gall bladder, or bile ducts, or both. General symptomatology may point to the affection of any other structure in or adjoining this area—abdominal wall, liver, stomach, pylorus, duodenum, pancreas, colon, kidney or peritoneum—and in some

cases pathological conditions cause localized changes below the right hypochondrium which may be confused with omental, general intestinal, appendiceal or ovarian disease.

The gall bladder and bile ducts, like other intestinal organs, are supplied both by sympathetic nerves and by sensory branches of the spinal nerves by way of the sympathetic; hence pain may be confined to the right hypochondrium, or referred to the dorsal segments of the seventh, eighth, ninth, tenth, and sometimes sixth dorsal nerves, and thence to the areas of peripheral sensory distribution of the same nerves, as shown in Diagram G.

B



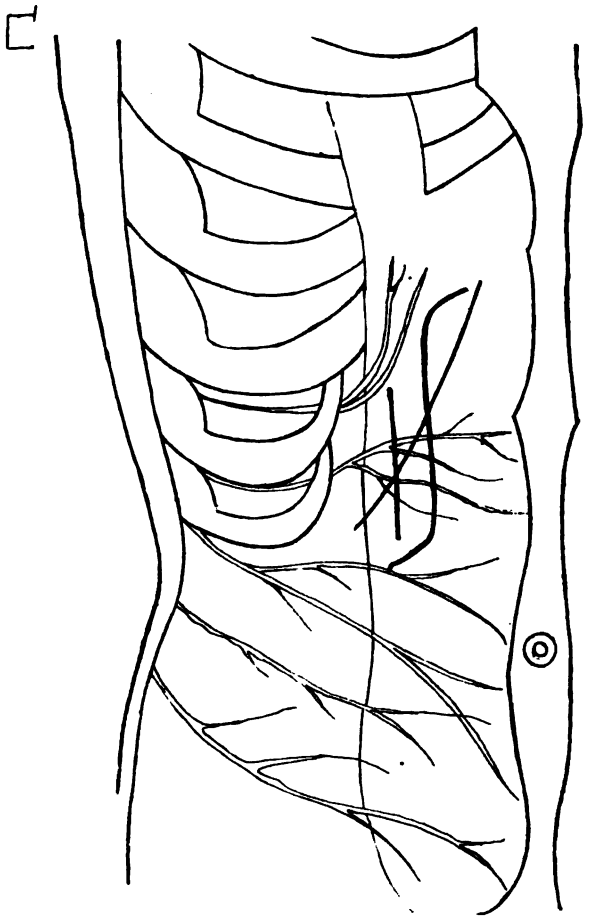
2. What, now, are the characteristics of the abdominal wall in this region? (Diagram B.) These bear directly on the question of incision. The incision must combine the following points:

a. It must avoid section of the branches of the dorsal nerves which supply the abdominal muscles and upon whose preservation the integrity of the abdominal wall after operative interference depends.

b. It must give free access to the parts involved and permit enlargement.

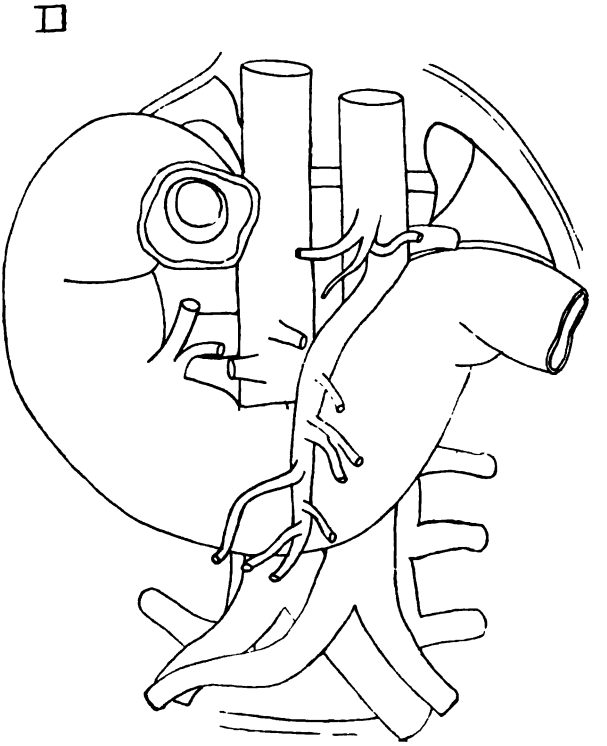
c. It must be in muscular tissue rather than aponeurotic, as repair is more satisfactory, but must cut the muscle fibres in such a way as to cause the least retraction.

In some cases, in spite of these requisites, a special incision may be needed to meet certain unusual conditions.



a. Dr. George Emerson Brewer, of New York, has recently shown by the careful dissection of formalin-hardened subjects that the branches of the dorsal nerves from the twelfth to the eighth inclusive occupy a nearly constant position, shown in Diagram C. He estimates that an incision made from a point

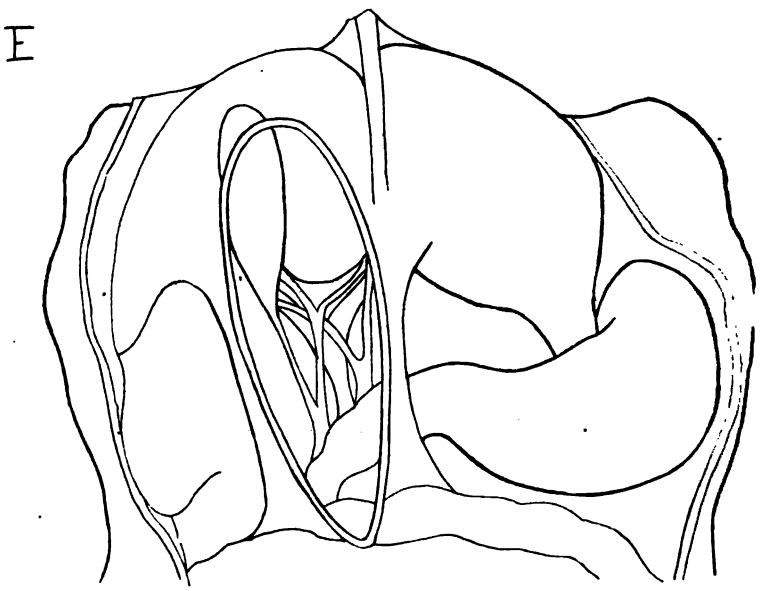
one-half inch below the free border of the eighth rib cartilage through the outer portion of the rectus straight downward to a point two inches above the umbilicus, or a curved incision from a point just below or outside the ensiform process parallel with the costal border to a point just above the emergence of the tenth nerve from under the costal margin, will sever only one nerve, the ninth. This is shown by the black lines in Diagram C.



Either incision fulfills the first requirement, non-section of the nerves, but neither gives the freest access to the parts or allows judicious enlargement.

b. The inner or mesial portion of the abdominal wall in this region consists of the rectus muscle and sheathing aponeuroses; the outer portion, which is much the smaller, of external oblique, internal oblique, and transversalis muscles and their aponeuroses. By making an incision which shall be a combina-

tion and a modification of the two mentioned above (see Diagram C), an italic s shaped incision as suggested by Dr. Bevan of Chicago, the nerves are still avoided, easy access to the region is gained (apply incision in Diagram C to outlined area in Diagram B), and the wound lies entirely in muscular tissue and passes through the rectus whose cut fibres are prevented from marked retraction by the lineae transversae; whereas an incision through the external oblique, internal oblique, and transversalis in the outer portion of the area will allow greater retraction, and



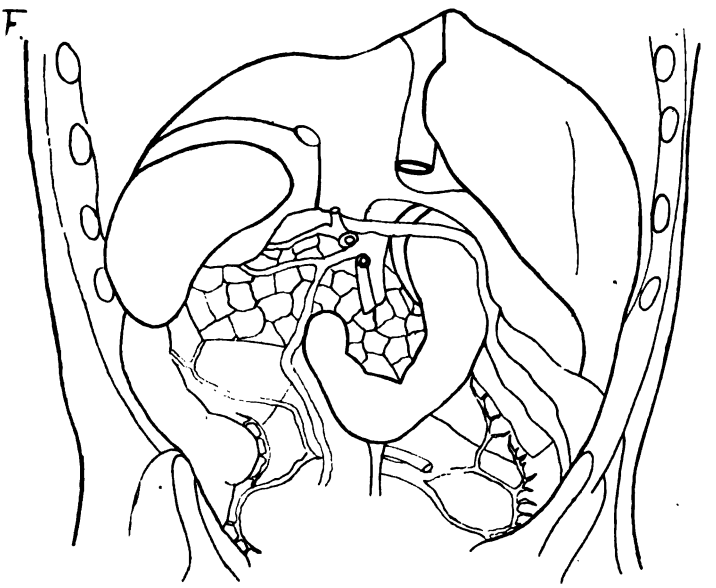
presents three muscular layers to be passed through instead of one. (See Diagram C.)

3. The region of the gall bladder and bile ducts is opened up. What are their relations? The general course of the bladder and passages has been followed. The whole field is shut off from the general abdominal cavity by the omentum passing downward over the colon and small intestines.

The gall bladder itself, the average length of which is three and four-fifths inches, is covered by peritoneum from its fundus to the transverse fissure of the liver, except one-fourth to one-

third of its surface which lies toward the liver, connective tissue only intervening. In some few cases the gall bladder is entirely surrounded by peritoneum, which then forms a mesentery, allowing comparatively wide excursions of the viscus. Brewer reports a rare case in which the gastro-hepatic omentum extended far to the right and the gall bladder was contained between the two layers.

By raising the liver and gall bladder the cystic and hepatic ducts are exposed. (See Diagram A.) They pass downward from the transverse fissure, joining below at an acute angle to form



the common duct, the upper part of which, with the two ducts mentioned, lies between the two layers of the gastro-hepatic omentum. (See Diagram E.) There they rest upon the portal vein with the hepatic artery at the inner side.

The average length of the cystic duct is two and one-fifth inches. It is the smallest duct in diameter; hence any stone passing through it will usually pass through the common duct. The spiral, valvular nature of the mucous membrane prevents probing of the cystic duct unless made patulous by the previous passing of gall stones.

The length of the hepatic duct is about two inches; the average length of the common duct is three and eight-tenths inches. Passing downward and behind the first part of the duodenum, it lies between the head of the pancreas and the second or descending portion (see Diagram F), pierces the coat of the intestines in that portion at its postero-internal aspect, courses three-fourths of an inch in the wall of the duodenum with the pancreatic duct, and opens with the latter into the diverticulum of Vater and thence into the intestine at the duodenal papilla. (See Diagram D.)

The cystic and hepatic ducts and the upper part of the common duct may be reached through the anterior layer of the gastro-hepatic omentum (see Diagram E), the liver and gall bladder being retracted upward. The lower part of the common duct may be reached either by incising the peritoneum at the right of the first and second portions of the duodenum toward the median line, or by incising the anterior layer of the gastro-hepatic omentum, then the anterior wall of the duodenum at the junction of the first and second portions, thus approaching the duct intra-intestinally, as suggested by Dr. McBurney. It is extremely difficult to locate the duodenal orifice, but Dr. Brewer has simplified the matter greatly. In seventy-seven cases he found on the mucous surface of the duodenum, at the junction of the first and second portions on the posterio-internal aspect, a sharp crescentic fold corresponding to the flexure at this point. (See Diagram D.) The average distance of this from the pylorus is 1.89 inches. Passing from the middle of this fold downward, the duodenal orifice of the common duct is found at an average distance of 1.36 inches. This can be quite accurately located by passing the left forefinger into the wound, feeling the fold, and then sliding the finger downward until the middle of the fold rests against the middle of the dorsum of the second phalanx. The papilla is invariably found at the tip of the finger one and one-fourth to one and one-half inches from the crescentic fold.

In closing, it must be said that extreme distension, previous inflammatory conditions, abnormalities, and obesity may distort relations, and inflammatory adhesions binding the gall bladder to the colon, duodenum, or pylorus may render access to

the ducts extremely difficult; but let at least the normal relations be understood before confronting the abnormal.

I am indebted to Dr. Brewer's recent investigations in this region, reported in the Annals of Surgery, June, 1899, for the figures showing the average length of the gall bladder and ducts.

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2. PATHOLOGY OF GALL STONES.

BY W. H. BERGTOLD, M. D., M. SC., DENVER.

In order to reach a correct understanding of our present knowledge concerning the pathology of gall-stones we must for a moment briefly review one or two points concerning the physiology of the bile. The bile is a composite fluid, alkaline in reaction, made up of bile-salts, i. e., glycocholate and taurocholate of sodium, coloring matter, inorganic salts, and a peculiar fat, cholesterin, which is held in solution under normal conditions by the taurocholate of sodium. The bile is probably secreted constantly, poured into the gall-bladder or into the intestine, or both, enough current occurring to probably counteract intestinal infection under ordinary circumstances.

Gall-stones, or cholelithiasis, are concretions of bile-salts, cholesterin, bile pigments, inorganic salts, or of two or more of these constituents, or of all. Cholelithiasis is a disease of adult life, uncommon under the age of 25; yet Still has found twenty cases recorded occurring before the age of 14 years, ten of which were in new-born or still-born infants. In adults the great preponderance is in females, the proportion given by various authors differing. A fair average is ten of males to twenty-five of females. In a series of 1,500 post-mortems it has been found that 12 per cent. adults exhibited gall-stones, and 2 per cent. of children. Gall-stones are commoner in large, stout individuals, and in climates where there is a marked tendency to intestinal disease.

The stones may occur singly or may be very numerous, one case being on record where 7,200 stones were found in the gall-bladder. They may be of any size in keeping with the size of

the gall-bladder or bile ducts. One case showed a gall-stone lodged in the gall-bladder five inches long and one and one-third inches thick, roughly cylindrical in shape owing to its formation in the gall-bladder. Furthermore, the shape varies according to the site of development and the number of stones present. In the ducts they are likely to be elongated, pipestem-like. When several large stones are found in the gall-bladder they are apt to present facets due to attrition between the stones at the points where they articulate. We find them free or engaged, i. e., free in some portion of the bile tract or engaged at a *point* in the bile tract too small to permit of their further passage. Most commonly they are found in the gall-bladder; *next* in the cystic and common ducts; rarely in the hepatic ducts; and very unusual in the liver itself, there being situated in some of the small ramifications of the hepatic duct. They may arise in any of the above mentioned portions of the bile tract.

In composition they vary as much as in site and situation of origin. The causes covering this variation in composition are as yet almost entirely unknown. Cholesterin forms from 70 to 80 per cent. of all stones, and in fact many a stone is found to be a mass of pure cholesterin. We also find that many of these concretions are composed largely of the precipitated bile acids or biliary salts and containing at the same time much bile *pigment*. Rarely we find that these calculi are made up of inorganic salts, notably calcium carbonate. The stones not largely composed of cholesterin are apt to be mixed in character.

Many objects have been noted as forming the nuclei of various stones:—a small mass of epithelial cells; a bit of mucus; a collection of cholesterin crystals; minute blood-clots; small entozoa; and, lastly but by no means of least importance, small collections of bacteria.

The last word concerning the causes of cholelithiasis has by no means been yet said. We have first to consider certain conditions which we may well call predisposing causes. Thus, as to age, we know that adults are more apt to suffer from this malady. In sex we find that females have a greater predisposition, and according to the mode of life, it has been noted that individuals leading sedentary lives, persons who have been long

incarcerated in prisons or asylums, and people given to high living suffer in greater proportion from gall-stones. As to temperament, one may say that that temperament leading to obesity is prone to bring about the formation of biliary calculi. This is especially true in men. It has been said that as the individual advances in age there is to be found more cholesterin in the blood, and that this may lead to an increase of cholesterin in the bile and later to precipitation with the formation of calculi. It seems to me, according to the light of our present knowledge, that the causes of bile-stones may be grouped under two heads, (1) a sluggish flow of the bile; and (2) a catarrhal condition of the bile tract. As to the first, anything leading to a retardation of the bile flow predisposes to the formation of bile-stones, and this explains a number of predisposing conditions mentioned just above, e. g., the aged are probably more prone because of their inactivity and tendency to increase of fat, two factors leading to lack of exercise and consequent sluggishness of biliary current. On the other hand it has been noted that bile-stones occur below the age of 14, especially in very young children, new-born or still-born, and it is here said to be due to the fact that in the foetus, and for a time after birth, the child has an appreciable degree of inspissation and thickening of the bile. A slow bile flow is found in females especially because of a number of inherent or acquired tendencies. First, pregnancies with their varying pressure on the abdominal contents may be a cause of retarded bile flow. The well known tendency to constipation in the female may bring about overloading and clogging of the hepatic flexure of the colon which secondarily causes dragging of the liver with more or less distortion of the gall-bladder and its out-going bile ducts. Then, too, the female is apt to be more inactive than the male, which, with her mode of dress, can not fail to be a factor, through corset pressure and the support of skirts, etc., on the abdominal region. Lastly, it is said that the costal type of breathing in the female causes an appreciable diminution of liver motion with a secondary sluggishness of the bile stream.

Prisoners and inmates of insane asylums, as stated before, exhibit a higher percentage of cholelithiasis than individuals

living a free life, and with them the condition is doubtless due to inactivity. This idea is corroborated by findings in wild animals and in the same species in captivity; for with the former gall-stones are said to be unknown, while with the latter, in menageries, etc., they are said to be comparatively frequent. In the insane there doubtless occurs another factor, and probably also with prisoners, i. e., a lessened resistence, lowered physical vitality and consequent greater liability to infection. On the other hand, stagnation of the bile current may be due to local causes,—obstruction of the ducts anywhere along their continuity in the form of tumors or pressure of old or recent inflammatory products, adhesions due to previous peritonitis or to ulcers of the stomach. Duodenal catarrh probably plays a larger role in the formation of biliary calculi than we are apt to believe or realize, and constipation irrespective of sex has probably considerable to do, through pressure, with slowing the bile current.

As to the second class of causes included under the head of catarrhal conditions of the bile tract, we may say that the recognition of the infectious element in this class of cases constitutes a great step in advance. I am of the impression that as time goes on the element of infection in the formation of gall-stones will be found to be of greater and greater importance.

Stagnation of the bile flow brings about alterations in the nutrition of the mucous membrane of the bile tract. It renders this area more liable to infection. Given an opportunity for an infection in the intestinal tract, e. g., typhoid fever, the catarrhal condition in the bile area leaves it more vulnerable to the infection of the typhoid bacillus. Furthermore, the catarrhal condition in the bile ducts in itself retards the flow of bile, and anything bringing about retardation lessens the natural washing effect necessary to maintaining the bile tract in a sterile condition. Thus, attacks of catarrhal jaundice, while they may not at once lead to the formation of biliary calculi, may even years after have an effect in their alterations on the mucous membrane of the bile ducts and gall-bladder. Again, infection with subsequent catarrhal conditions of the gall-bladder

and bile ducts leads to desquamation, and the desquamated cells furnish ready-at-hand nuclei. Moreover, infection of the bile tract very often brings about an acid condition in the bile which at once leads to precipitation of the bile salts and secondarily of cholesterin. Welch has found bacteria in the center of gall-stones even though the bile at the same time was sterile, showing a previous infection with a later return through the natural methods to a sterile bile condition; and Mignot has caused cholelithiasis in rabbits by injecting bacteria into the gall-bladder. The following micro-organisms have been found in the gall-bladder or in gall-stones: the bacillus of typhoid fever; the bacillus coli communis; the staphylococcus albus; and the bacillus of influenza.

Much has been said concerning the relation of carcinoma of the liver and bile tract with the presence of gall-stones. The co-existence of these two conditions has been observed too often to allow us to consider it a mere coincidence. Musser has stated that 90 per cent. of the cases of carcinoma of the liver or bile ducts are accompanied by gall-stones. The exact relation of these two maladies is as yet undefined. It is possible that the carcinoma may be a predisposing, possibly an active, cause of cholelithiasis. On the contrary, the presence of biliary calculi may act as a focus of irritation, thereby lessening resistance and giving an avenue of entrance to the carcinomatous affection. This relation may be analogous to the supposed connection between irritation of the lip, as constant smoking, and a development of epithelial carcinoma at that locality.

In resumé, let me reiterate: First, the great predisposing cause is anything leading to sluggishness of the bile flow; and, second, I believe that an element of infection is probably to be found in the vast majority of all cases as the active cause; and, lastly, I wish to impress upon you the very frequent occurrence of biliary calculi without icterus.

3. THE SYMPTOMS AND COMPLICATIONS OF GALL STONES.

BY CARROLL E. EDSON, A. M., M. D., DENVER.

The mere presence of calculi in the gall bladder usually causes no symptoms whatever. Naunyn states that they are found in 25 per cent. of all women over sixty years of age.

Acting as a foreign body, they may by mechanical pressure increase or determine local ulceration in case of cholecystitis. Otherwise they are of importance only when they become dislodged into the biliary passages, causing distressing symptoms and often serious complicating lesions which we may consider briefly under three captions:

I. Disturbances caused by the passage of a stone along the biliary ducts—gall stone colic.

II. The immediate effects of a permanent impaction of a stone in any part of this canal.

III. The secondary and more remote lesions due to gall stones.

I. Symptoms caused by the passage of a stone along the biliary ducts.

Occasionally the passage of a gall stone is preceded for a short time by slight prodromata, such as discomfort, and pain, not amounting to colic, in the right hypochondrium; a sense of distension, nausea, a rise of temperature to 99 or 99.5 degrees F., with yawning or mild nervous shiverings.

As a rule, however, the onset is abrupt and violent, and, while it may be precipitated by sudden exertion, as coughing, or a severe jar, in the great majority of cases it follows a hearty meal about two or three hours, at the time of secondary digestion. The very frequent occurrence of an attack in the night may be explained by the recumbent position at this period of secondary digestion.

The symptoms are typical but not constant. The most common and essential is pain, due to the *over-stretching* of the narrow bile passage—not to spasm. It is intense, tearing, agonizing,

so that the patient is rarely able to lie still. It is said by many women to be worse than that of labor. It is located in the upper abdomen, in the epigastrium or right hypochondrium (unless the stone be in the common duct with an uninvolved gall bladder), and is fixed, or radiates to the back, occasionally to the right scapula or shoulder, rarely to the left. At first the pain is relieved by pressure; but soon the belly becomes sensitive, the hypochondriac region rigid, and the pain is increased by pressure or even by respiration, which becomes thoracic instead of diaphragmatic.

As a result of the severe pain and disturbance of the nervous plexus in the gastro-hepatic region, nausea occurs, which gives place to vomiting—first of the contents of the stomach and then, so long as the hepatic and common ducts are not occluded, of bile-stained fluid. Fecal vomiting never or rarely occurs. As a rule, the vomiting is slight, but it has proved persistent and fatal.

A not uncommon occurrence at this stage of the attack is a chill, with rise of temperature to 102 or even 103 degrees. Its exact nature is not always clear. It may be distinctly nervous, comparable to the catheter chill, or with the fever, which occurs in 22 per cent. of cases, be the result of infection from septic processes.

The systemic effects of the pain and vomiting are seen in sweating, great general depression which has in at least one reported case led to fatal syncope, and a weak pulse, which may be rapid or slow as circumstances determine.

The bowels are confined and the stools usually scanty. They are normal or clay colored, according to the patency or occlusion of the bile duct.

There is often great flatulence during and following the attack. Fatal ileus has occurred from this paralytic distension of the gut. There is usually tenderness over the liver and gall bladder, which may become swollen. The spleen is rarely enlarged unless an infective process is also present.

The occurrence of jaundice is in no way an essential sign, and depends wholly upon the location and completeness of the obstruction to the bile passage. Few cases, however, pass through an attack without at least mild icterus, due to mechan-

ical blocking or the resulting cholangeal catarrh. The jaundice may be slight, detected only in the urine, or marked, or intermittent. It usually ceases a few days after the attack.

Complications of an acute attack are:

Ileus from pain.
Shock.
Fatal vomiting.
Rupture of gall bladder.
Mitral murmur.
Palpitation.

II. The immediate effects of the permanent impaction of a gall stone in the biliary passages vary much, according to the point at which the stone becomes lodged. This may occur:

a. In the cystic duct.
b. In the hepatic duct. Very rarely and usually secondarily.
c. In the common duct. Usually at the exit at the papilla in the pouch of Vater. A stone which passes the cystic duct rarely becomes lodged in the common duct.

a. The occlusion of the cystic duct may result:
   i. In the development of a retention cyst—a hydrops vesicae.
   ii. In suppuration, with empyema of the gall bladder.
   iii. Phlegmonous cystitis. (Rare—seven cases.)
   iv. Atrophy.

b. Stones impacted in the hepatic duct are rare—usually secondary and difficult of differential diagnosis.

c. Obstruction of the common duct leads to retention of bile, jaundice, which though at first mechanical very soon becomes associated with either
   (a) Catarrhal cholangitis—the usual result; or,
   (b) A suppurative cholangitis—rather infrequent and always fatal.

(a) A chronic impacted gall stone, with the associated catarrhal cholangitis, gives rise to a complex of very characteristic symptoms:

i. Jaundice of varying intensity, but as a rule increasing after each attack of

ii. Pain, which occurs from time to time in the region of the liver. This pain, associated with tenderness, is not as a rule colicky, but of a dull persistent character, often accompanied by the sharper pain of subacute peritoneal inflammation.

iii. Ague-like paroxysms of fever, with chill and a temperature reaching 103 or 105 degrees. In the intervals there is no fever and either absence of any symptoms, save jaundice, or a mild digestive disturbance.

This condition may last for years without any marked deterioration of the health. Osler states that these patients are especially liable to secondary endocarditis and pericarditis.

A symptom of great help in diagnosis is the area of cutaneous tenderness, corresponding to the spinal segment involved in the visceral lesion.

(b) If suppurative cholangitis occurs in case of an impacted stone, the course is marked by severe remittent rather than intermittent fever, less jaundice, greater enlargement of the liver, septicaemia, and death.

III. Remote complications.

The presence or impaction of gall stones may lead to the most serious and far-reaching complications—which may be

a. Mechanical. Some of these we have already touched upon as immediate results. More distant effects have been recorded as follows:

i. Ileus from intestinal atony, due to pain from pressure on nerves.

ii. Acute intestinal obstruction, due to

(a) Volvulus.

(b) Impaction of a large stone in bowel after ulceration into gut.

(c) Paralysis from local peritonitis set up by inflammation.

(d) A band—the result of an inflammation from stone perhaps years before.

iii. Dilated stomach from obstruction to pylorus by
  (a) Stone.
  (b) Adhesions.
iv. Pancreatic cyst from obstruction of duct.

b. Inflammatory and infective:
  i. Local peritonitis. Probably no severe attack of biliary colic fails to leave some simple peritoneal inflammation behind, which may cause *only* chronic pain from adhesions or mechanical trouble as above.
  ii. Infective processes—may result in
    (a) Cholangitis, with hepatic abscess, which may cause death from sepsis, or rupture into
      i. Peritoneum.
      ii. Pleura.
      iii. Lung.
      iv. Retro-peritoneally.
      v. Pelvis of kidney.
    (b) Cholecystitis:
      i. Simple.
      ii. Phlegmonous.
      iii. Gangrenous.
      iv. Suppurative—the empyema opening
        (*a*) Externally.
        (*b*) Into abdomen.
        (*c*) Into bowel.

c. Ulcerative and perforative, resulting in fistulous communications between adjacent parts. Such passages may occur between
  i. Different parts of the biliary tract with each other, as the gall bladder and the hepatic duct.
  ii. The biliary tract and the abdominal cavity.
  iii. The biliary tract and the outside world, especially between the gall bladder and abdominal wall.
  iv. The biliary tract and the intestinal canal, usually into the colon, next in frequency into the duodenum, rarely into the stomach and very rarely into the jejunum or ileum.

v. Between the biliary tract and the pelvis of the kidney, the bladder, or into the vagina.

vi. Between the biliary tract and the blood vessels, as from the common duct into the portal vein, as in the case of Ignatius Loyola.

d. Haemorrhage of serious degree has resulted from long standing jaundice.

e. Cancer not infrequently develops from the irritation caused by gall stones.

f. And, lastly, the very frequent result is a chronic invalidism from pain, jaundice, and nervous disturbance.

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4. THE DIFFERENTIAL DIAGNOSIS OF GALL STONES.

BY P. J. McHUGH, M. D., FORT COLLINS.

The majority of cases of gall stones remain entirely quiescent during life. The cases that cause symptoms sufficiently severe to require medical and surgical attention may be mistaken for a loose kidney. Such an error was once made by Tait, who cut down on the gall bladder before his mistake was discovered.

A gall bladder containing stones is pear-shaped, in contradistinction to the crescent-shaped construction of the kidney. The latter is situated much lower than the gall bladder and its range of mobility is different. The kidney, when loose, can, as a rule, be moved in all directions. When down, and pressure made by the hands on either side or its lower border, it shoots back in a characteristic manner. The gall bladder containing stones, being suspended from a fixed point, traverses in its movements the arc of a circle having for its radius the length of the bladder itself. When pressed between the hands it does not shoot away like the kidney. Occasionally crepitation may be felt in gall stones, never in a movable kidney.

Pain, however, is the supreme symptom. It is produced by the passage of stones along the course of the ducts; its violence makes it diagnostic; no other pain is just like it, and in its

atrocious presence in the locality of the liver we can hardly mistake its origin.

The sex and age of the patient are important factors in arriving at a diagnosis. Different authorities put the proportion of females to males differently. Fürbringer puts it as 4 to 1, Bollinger as 5 to 2. The proportion accepted, however, by most authorities is as 3 to 2. Gall stones prevail most frequently in persons above the age of 35 years, although they may be found at any period of life. They may be mistaken for gastralgia, intestinal or renal colic, cancer of the liver or of the head of the pancreas, hepatic neuralgia, and intestinal obstruction.

In the absence of jaundice, gastralgia may be mistaken *for* gall stone colic. The pain in gastralgia, however, is located in the stomach, that of gall stone in the right hypochondrium. Gastralgia is usually dependent on some gastric disorder or occurs in those suffering from neurotic affections or neuralgias in other parts of the body—as the head, the intercostal muscles, etc. It occurs most frequently in anaemic girls, while gall stones occur usually in those of more advanced life. Gastralgia is more persistent, the intervals between the attacks, as a rule, being much shorter. It is prone to gradually grow less severe toward the end, while biliary colic ceases suddenly after the passage of the stone. In gall stone colic the presence of stone in the feces following an attack is pathognomonic.

The pain of intestinal colic is relieved by pressure, that *of* gall stone is not, but is frequently aggravated by it. The pain in intestinal colic is intermittent; in gall stone it is constant, though paroxysmal. There is never jaundice in intestinal colic; in gall stone it is frequently present. Diarrhoea either accompanies or follows intestinal colic; in gall stone the stools are hard and often clay colored. A flatulent condition of the bowels usually exists in intestinal colic; in biliary colic flatus is absent.

In colic due to plumbism the bowels are constipated; there is a history of exposure and also of repeated attacks. The lead line is present on the gums; the pulse is retarded, often appearing as low as thirty beats per minute; pain in the joints, especially in the knee, cramps of the muscles, paralysis, as wrist drop, and trophic changes, as wasting, are symptoms common to plumbism and not to gall stone.

Renal colic differs from gall stone colic in that the urine almost always contain blood, pus, gravel, and "tailed epithelium" from the pelvis of the kidneys. The pain of renal colic shoots downward along the course of the ureters to the urethra, the inside of the thigh, etc.

I quote from Whittaker the following in relation to the diagnosis of gall stone from cancer: "Very difficult at times is the distinction between gall stone and *cancer*. Primary cancer of the gall bladder or of the liver in such situation as to compress the bile-duct is rare. Cancer secondary to affections of the stomach is the rule. A previous history of cancer of the stomach, more especially the discovery or the recognition of a tumor distinctly palpable and separable from an enlarged or dropsical gall bladder, is a sign of great importance. Blood in the stools may occur in either or neither affection. It is more wont to occur in affection of the liver than in gall stone. The discovery of secondary deposits of cancer rarely assists in the diagnosis. Colic, if present at all, is not so severe in cancer. Aspiration of the gall bladder and withdrawal of the bile indicate only compression without regard to cause. The author made the first diagnosis by means of a needle used as a sound. The long fine needle of the aspirator of Dieulafoy's apparatus was pushed into the neck of the bladder and the stone was found distinctly palpable to the touch. Gall stones are, however, so soft as to escape detection in this way and carcinoma may be so hard as to nearly simulate a gall stone. Long continued occlusion, with persistent jaundice, marasmus, etc., in an individual of advanced life speaks stronger for cancer than gall stone."

Hepatic neuralgia may be differentiated from gall stone by its location and by the absence of jaundice. It occurs in persons subject to other forms of neuralgia.

Intestinal obstruction may be differentiated from gall stone by the presence of excessive vomiting, ofttimes fecal, and obstinate constipation.

5. THE MEDICAL TREATMENT OF GALL STONES.

BY HENRY SEWALL, M. D., DENVER.

The medical man who engages in the specialty of general practice is continually running across cases which present the symptoms of gall stone formation. Supposing a satisfactory diagnosis of the condition to have been reached, it is seldom that both patient and physician will not prefer at first to palliate and temporize with medical measures rather than risk the quietus of surgical interference.

The medical treatment of gall stones is a corollary of the pathology of the disorder. As has already been said, gall stones are commonly composed of cholesterin or a mixture of cholesterin and bile pigment. Sometimes they consist of the bile pigment bilirubin and biliverdin-calcium or of calcium carbonate. According to Naunyn there are two conditions that lead to the formation of gall stones: 1, Alteration of the mucous membrane of the bile passages or gall bladder, leading to destruction and desquamation of the lining epithelium and outpouring of mucus; 2, stagnation of bile in its proper channels, under which condition cholesterin and bilirubin-calcium are precipitated on the organic detritus. It is open to strong suspicion that the presence of bacteria in the bile ducts and gall bladder may be responsible for alterations in the mucous membrane and lead to the precipitation of substances dissolved in the bile. The B. coli communis has been supposed to have special power to effect changes in the lining membrane of the bile passages. Naunyn asserts that bilirubin-calcium is readily precipitated from the bile when it contains excessive quantities of calcium brought to it by the blood. The cholesterin seems to be formed *in situ* by the epithelium cells lining the passages. There is reason to believe that stone formation is favored by increased viscosity of the bile, as well as by its retention due to catarrhal swelling of the biliary mucous membrane. In fact, Mayo Robson asserts that "Catarrh of the mucous membrane of the bile passages increases the amount of cholesterin present,

and the longer the bile remains in the gall bladder the more cholesterin it will contain. Anything, therefore, which causes stagnation of the bile may dispose to gall stones; on the other hand, whatever leads to a regular emptying of the bile passages will tend to clear out such detritus as cast-off cells and incipient collections of cholesterin crystals and mucus, and thus prevent the formation of gall stones." The formation of the stones is probably limited nearly altogether to the gall bladder.

The medical treatment of gall stones resolves itself into prophylactic and palliative measures, of which the former is vastly more effective. When the stone is already of considerable size in the gall bladder, or incarcerated in a bile duct, I can see no way of reducing its volume. Olive oil in a test tube is said to dissolve the stone, but it is exceedingly improbable that it reaches it at the seat of the trouble; and the digestive disturbance apt to be set up by the large quantities of olive oil is much to be feared. We can, however, dilute the bile, and free the bile ducts of the viscid secretion, and thus wash away detritus and prevent the growth of old stones and the formation of new ones. To this end I know of nothing better than large draughts of water and repeated doses of phosphate of soda until thorough looseness of the bowels is maintained. It is true that with complete occlusion of a bile duct such treatment would lead to increased distension of the biliary channels, but it is well worth the risk, for peristalsis of the ducts would be thereby favored; moreover, the dangers of rupture from over-distension are insignificant because the bile is secreted under a very low head of pressure, and the grade of jaundice can keep us in touch with the conditions. Moreover, in complete obstruction our resort must in every case be surgical interference. The diet is important, for the bile acids which largely keep the biliary matters in solution are products of proteid metabolism. Meat eaters are said to be much less subject to gall stones than those who live principally on carbohydrates. Constricting dress, as the corsets of females, is said to interfere with the evacuation of the gall bladder and predisposes to the formation of stone. The pathology of stone formation brings into especial prominence the importance of such exercise of muscles, both skeletal and visceral, as to keep active the

circulation of the blood and its secretions, and makes especially important the medical treatment of the very first attack resembling biliary colic.

When called to a case in the throes of gall stone obstruction relief from pain may possibly be brought about by a glass of hot water internally and hot fomentations externally. But the chances are greatly in favor of morphine in full doses being required under the skin, and inhalation of chloroform, while waiting on the action of morphine, may be necessary. There is no obvious reason why the patient should not at once be put on doses of phosphate of soda—a heaping teaspoon in a glass of hot water every hour or two until the bowels move freely, and later at wider intervals. Peristalsis may be favored by a copious enema of warm water. The diet should be largely proteid, with a minimal amount of carbohydrate, and an ox gall pill with pancreatin and nux vomica three times a day has seemed to me to have good results. With the mixtures of ether and turpentine advised by French authors I have had no experience. From the beginning to the end of the attack the physician should exercise the keenest scrutiny over the bowel discharges for the presence of gall stones. The finding of such is a great moral support of the correctness of the diagnosis, as well as evidence of the patency of the bile ducts. It should be observed that the form of the smooth facetted stone so often found in the gall bladder may be departed from. In the case of a man entering upon old age whom I saw through a recurrent attack several years ago, the stone was cylindrical, about three-fourths of an inch long by one-fifth of an inch in diameter, rough outside, friable and yellow in color. Not until chemical analysis demonstrated it to be made up chiefly of cholesterin was it certain that it did not represent a fecal concretion.

The most serious duty of the physician, it seems to me, in the conduct of these cases is to preserve an eagle watchfulness of the course of the disorder to detect the earliest signs of any of the many complications and sequels of the condition which may at once change its whole aspect and prove of imminent danger to life. In a word, the possibility of emergency surgery being required in the treatment of gall stones must always be prominent in the mind of the physician.

6. THE SURGICAL TREATMENT OF CALCULI IN THE GALL BLADDER.

BY E. J. A. ROGERS, M. D., DENVER.

One physician having made a positive diagnosis, another having exhausted the resources of internal medicine, and the patient being still unrelieved, the surgeon is called in consultation.

The division of the surgical treatment of gall-stones that has been adopted for this discussion is unfortunate, for it is generally almost impossible until an operation has been at least partly performed to determine whether the seat of the trouble is in the gall-bladder or in the ducts, or whether they are not both involved, as is so frequently the case.

Calculi in the gall-bladder may produce no symptoms whatever, as is so often the case even for a long period, and we only discover their presence when the ducts become involved, or not until there is some irritation of the ducts as may be produced without the actual entrance of the calculi into the duct itself.

If every gall-bladder containing calculi were placed under vigorous treatment, many of us here to-night, who consider ourselves in perfect health, would be at home undergoing proper treatment. Indeed, to follow out this idea, the time may not be far distant when we shall each, at regular intervals (as we should now go to our dentists to have our teeth examined), go to our X-rayer, or some other rayer, to have our gall-bladder examined, to determine whether we should take anticholecystic calculi serum, chlorate of sodium, or some other proper remedy to relieve us of the danger of cholecystitis.

If, however, there were no symptoms, there has in all probability been no internal treatment, and so the patient would not have come to the surgeon for the only recourse left—operation.

The opinion is, I believe, fast gaining ground that positive symptoms of gall-stones call for early radical procedure—quite as positively, if not more so, as the diagnosis of appendicitis calls for the removal of that organ.

The determination for operation is not based upon any fixed group of symptoms, but may be arrived at from very slight symptoms if they are persistent, or from a single symptom if it be sufficiently marked or at all threatening.

To be brief, operation upon the gall-bladder seems generally advisable:

1. Should there be a persistent tumor in that region, even though without other symptoms, and especially if the tumor be accompanied by jaundice, or by biliary colic, or by both, or should the tumor show any signs of becoming inflamed.

2. Should there be jaundice accompanied by local tenderness, especially if that jaundice began with severe local pain, or be accompanied by attacks of colic, and especially if the paroxysms of colic be accompanied by chills, or if we have any reason to believe it due to obstruction of the ducts.

3. Should there be repeated attacks of biliary colic even without jaundice or tumor, especially if the attacks be accompanied by chills.

4. Should there be persistent local pain or tenderness even without tumor or jaundice, for then we should suspect adhesions from old trouble, which could only be relieved by operation.

5. Should there be indications of beginning inflammation in that region, and especially if peritonitis be threatened originating in this area.

In the conditions we have named almost the only marked contra-indication to operation would be a belief that the symptoms were produced by malignant disease; but even then could we find cause to hope that the disease were localized to the gall-bladder so that it could be removed completely, we should give our patient the benefit of that one chance.

Our constant alertness for cases of appendicitis has caused many cases of gall-bladder inflammation to be mistaken for that disease, and has led to many mistakes in operating. But such mistakes are usually to the patient's advantage, for there is less risk to the patient in an operation on an inflamed gall-bladder, so long as the inflammation has not spread to adjacent tissues, than in an operation in acute appendicitis.

There can be no question, however, but that we can have a much more extensive destructive inflammation about the gall-bladder with much less marked symptoms than the same degree of inflammation would produce about the appendix, or, indeed, anywhere in the lower peritoneal cavity.

And now having determined upon operation, when and how shall we go about it?

We can not too emphatically realize that delay is dangerous, and is dangerous in proportion to the acuteness of the symptoms.

As to the point of operation, if we have a tumor or definitely localized symptoms present, they are the direct guide to our point of entrance.

But in the absence of any such definite indications the point of selection may be said to be the end of the tenth costal cartilage, just external to the rectus muscle, or just inside this through the muscle.

The most popular and commonly practised line of incision has hitherto been a vertical line immediately over the point to be reached; the S. incision described in the anatomy paper is, however, now becoming popular; and in exceptional cases the angular incision practised by Czerny may have advantages, but such cases are rare. If we get down over the margin of the liver, this organ may easily be raised and thus give us an improved field of view. Having exposed the area, we now introduce our fingers and thoroughly examine the condition in and about the gall-bladder and ducts. If we find the gall-bladder alone involved, we will proceed to relieve the condition. If the ducts alone are involved, we will turn the case over to the next speaker; and if the parts show a large area of adhesions, we will proceed with great caution, and with the expectation that, though the gall-bladder is probably inflamed or perhaps completely destroyed (as in a case I recently operated upon), the primary cause of the condition will probably be found in or about the ducts.

Should there be pus external to the gall-bladder we would clean it away, carefully sponging off all soiled tissue, and applying such antiseptics as seem advisable. For this purpose

95% of carbolic acid is now coming much into vogue, washing it away immediately afterwards with alcohol, as first discovered and since much used by Powell in New York. We would, of course, exercise the same precaution against infecting or injuring healthy tissue as in other areas of the abdomen; although there is less danger here, on account of the limited space and probable close adhesions, than amongst the intestines.

If the trouble is solely calculi in the gall-bladder, accompanied by a very moderate amount of inflammation, we will raise the gall-bladder as nearly into the wound as possible, carefully pack off the tissues below, and, holding the fundus of the bladder carefully in place with delicate tenacula or forceps, make a short linear incision just large enough to introduce one finger, being careful as we do so not to allow the contents to prematurely overflow. We will now probably cautiously introduce a finger through this opening, thus sealing it again, and with two fingers of the other hand external to the bladder carefully examine its contents. If we find the whole contents easily reached and removable, we will withdraw the finger and carefully evacuate the bladder, being careful that none of the contents enter the interior of the wound. If necessary, we may use forceps or a spoon to assist in this, but the fingers external to the bladder are more useful than anything else in doing this.

The ideal operation is, of course, to now close our incision in the gall-bladder, return it to its place, and close the wound; but such a proceeding seems to me even more rarely advisable than it is possible. Indeed, practically, we can seldom attempt it.

If we are satisfied, however, that our calculi and irritating material have been removed, we may now stitch the margins of the opening to the exposed muscular aponeurosis, and, if all is clean, close the remainder of the wound, leaving only this direct fistula into the bladder.

If in this proceeding the tissues external to the bladder have been soiled, we must, of course, clean them, even irrigate them out if it seem wise, and we may also irrigate the bladder. But it is very doubtful if healthy bile is of any injury to the tissues, as spilling it seldom results in any trouble whatever.

If, however, the contents of the gall-bladder are inflammatory, or if there has been any pus external to the bladder in the tissues, it seems to me wise to leave the drainage outside of the bladder as well as from it, and allow the cavity to slowly close from the bottom.

If the interior of the bladder be the seat of suppuration, it will probably be wise, after washing it out, to leave a drainage tube through the fistulous opening and keep it there as long as pus continues to flow.

If, however, all is clean, and the mucous membrane quite healthy, a drainage tube or other material is unnecessary, and the fistula can be allowed to take care of itself.

If all obstructions have been completely removed such a fistula very rapidly closes, and a second operation is seldom necessary to bring this about and should only be resorted to after the fistula has persisted for some months.

I hope I am clearly understood in this as intentionally omitting all reference to obstruction in the ducts, as these will be considered by the next speaker.

If the cause of irritation is confined to the gall-bladder alone, and the steps that I have detailed are carefully carried out, the result is almost uniformly satisfactory.

Should the gall-bladder be so contracted as to render it impossible to bring it up into the wound, we may then carefully pack around it, leaving a canal through our packing to the surface, and cut into it in situ and empty it, and depend upon the secretions finding their way to the surface through a drainage tube finally introduced through the centre of our packing.

The results in these cases, though, of course, attended by more risk than in others, are usually satisfactory.

The cases where the gall-bladder should be completely removed are so rare that I need not stop to refer to them. It is an operation that is seldom seen where the cause of disease is simply calculi or inflammation.

Where there is suppuration within the gall-bladder but none without, we may debate the advisability of fastening the gall-bladder into the wound to await adhesions before opening it.

The president warns me, however, that my ten minutes have expired.

7. THE SURGICAL MANAGEMENT OF CALCULI IN THE BILIARY DUCTS.

BY CLAYTON PARKHILL, M. D., DENVER.

Gall-stones had been removed from the gall-ducts in the course of operation on numerous occasions before any definite operation had been planned for their removal. This had occurred as much as 200 years ago; but it was not until nine years ago that an operation was deliberately planned and executed for the removal of stones from the ducts. This was done by Courvoisier, although Marcy of Boston claims priority of one year. Marcy's operation, however, seems to have been planned for the gall-bladder, and a stone being found in the common duct it was removed.

The abdominal incision for the removal of stones from the biliary ducts is the same that has been described by those who have preceded me for operations upon the gall-bladder. Almost invariably when stones are present in the biliary ducts we find the ducts surrounded by adhesions of greater or less firmness. The cholangitis resulting from the presence of the stone is the cause of these adhesions. The first step in the operation after the opening of the abdomen is the breaking up of these adhesions and the freeing of the gall-bladder and the ducts. This is best effected by using a sponge rather than the naked finger. Great care is necessary, however, that neither the gall-bladder nor the ducts shall be ruptured. After the ducts have been freed in this manner, it may be possible to locate the stone or stones readily and accurately. Some cases, however, present great difficulty, and some have been recorded in which it was impossible to locate the stones during the life of the patient. I have seen one case in which I found it impossible to determine whether I had to deal with a large stone near the duodenal extremity of the common duct or a carcinoma of the pancreas until I had made a section of this organ.

The guide for the examination for stones in the ducts is the foramen of Winslow. When this is found, with the index

finger of the left hand passed through it, its convex inner border will lie upon the finger, and within this fold is lodged the common duct; the fingers of the left hand remaining in position, and the fingers of the right hand passed along this fold in front, the duct can be palpated between them. By following the common duct towards the liver the cystic duct may be palpated, and the hepatic duct to a greater or less extent, although in many cases this is palpated with great difficulty.

Gall-stones may be located in any one of these ducts, although most frequently discovered in the common duct or the beginning of the cystic, and from these positions their removal is most easily effected. When lodged in the common duct they will usually be found near its duodenal extremity in what is known as the ampulla of Vater.

Stones in the ducts are usually single, although they may be multiple. Most frequently they are round or ovoid in shape. The ducts are more or less dilated and in some cases to a very considerable extent.

The stone having been located, the question will arise as to what method of procedure to employ for its removal. It has been recommended that a needle be passed through the duct, the stone broken into fragments, and those fragments left to find their way into the duodenum. This is a procedure which has practically been abandoned, on account of its uncertainty and the danger of its giving rise to infection. Stones have been crushed in the ducts between the padded jaws of forceps and the fragments left to find their way into the duodenum. This likewise has practically been abandoned. The procedure of election is what is known as choledochotomy, or a cutting open of the duct and removal of the stone. Before this should be attempted the abdomen should be carefully walled off with sponge, as the bile may be infected and its escape give rise to a peritonitis, septic or otherwise. The index finger of the left hand should be passed behind the duct and it should be opened on it. It should be borne in mind, however, that the portal vein lies in close relationship to the beginning of the common duct and the terminal portion of the cystic duct. Great care should be taken to avoid wounding this structure, as such an

accident would involve serious if not fatal consequences. When the duct has been opened the stone may be removed with comparatively little difficulty. When one stone has been removed the duct should be explored carefully to determine the presence or absence of other stones. When this can not be performed satisfactorily with the fingers, the probe or searcher, as recommended by Fenger, will be found of great value. After the removal of the stone or stones and the cleansing of the site of operation, the question will arise as to how the opened duct should be treated. I have operated upon one case in which I found the duct so greatly dilated as to enable me to make a Murphy button anastomosis between the duct and the duodenum. This, however, will probably rarely be possible. It is usually wise to suture the opening in the duct. This is best accomplished by using fine silk and introducing Lembert's sutures. The ends of the sutures should be left long to enable an assistant to control the duct while the other sutures are being introduced. These sutures should include the peritoneal and muscular coats of the duct only. They may be re-enforced by a secondary line of peritoneal sutures. In many cases it will be found impossible to prevent more or less leakage from the duct or from the needle punctures, and rarely, if ever, will one feel justified in closing the abdomen without drainage. Drainage of this site of operation may be accomplished in two ways and in different directions. It may be either posteriorly through the foramen of Winslow and the lesser peritoneal cavity, an external opening being made near the lower end of the right kidney; or it may be anteriorly from the site of the operation through the original incision in the abdominal wall. Tubular drainage is usually best reinforced by slender strips of sterile gauze. The completion of the operation would be made in the same way as in any ordinary abdominal procedure. In the after-treatment of the case, if there be considerable drainage of bile from the wound, it will be necessary to protect the skin in order to prevent its excoriation. This can best be accomplished, perhaps, by the use of an unguent containing some alkali, such as bi-carbonate of soda, liberally smeared upon the surface of the skin. The after-progress of the case possesses no special features not involved in ordinary abdominal operations with drainage.

DISCUSSION OF THE SYMPOSIUM ON GALL STONES.

The President—I am glad to say that we have one with us to-night who is eminently qualified to discuss this question, and we will ask him to open the discussion upon gall stones. I refer to Dr. Roberts of Philadelphia. (Applause.)

Dr. John B. Roberts—It is very kind to call upon me to say a word to-night. I am not prepared to speak, and have nothing to add to this interesting discussion except perhaps one or two items, it may be, of personal experience.

This topic is one which is, of course, exceedingly interesting to practitioners in all parts of the country because the disease is one which is not infrequent, and one which I think the surgeons at least have learned in the last few years to treat more satisfactorily than formerly. It is, of course, true, as one of the speakers has stated to-night, that gall stones are exceedingly common and they often produce no symptoms, but are found, or known to be present, only when examinations are made after death. It is undoubtedly a fact, however, as I think all will admit, that gall stones are a very serious menace to life, particularly when they begin to descend into the biliary passages. Only the winter just past I was called to see in consultation a man who had been treated by his family doctor for a few days for what appeared to be only an ordinary case of catarrhal jaundice. He was not very much worse that morning, but his physician thought it was wise to have surgical consultation. We went to the house and found the man moribund from what seemed to be a sudden perforation of the gall duct or gall bladder. That thing does not happen very often, I think, but it is a menace to health which makes me at least a little more apt to advise an operation in cholelithiasis than I used to do. The subject has been thoroughly discussed and in a way exceedingly illustrative of the conditions. We can hardly, it seems to me, differ from the views which have been advanced by the speakers of the evening.

Clinically it may be interesting to mention a case I saw a few weeks ago which interested me because it was rather an unusual thing in my experience. I was called to see a woman,

with very thick abdominal wall, who had had what was said to be a number of attacks of bile colic within the last few years. I found a history of her having had once a little jaundice and of having once passed what was said to be a gall stone. She was suffering intense, agonizing pain of a coliky character. I made what I believed then was the true diagnosis—a diagnosis of a gall stone colic—and advised operation. After an extended talk she refused. After another severe attack of colic she put herself under my care. I then had opportunity to examine her more thoroughly and found to my chagrin that she had a small umbilical hernia which was scarcely perceptible because of the great amount of fat in the abdominal wall. She had never mentioned it to the doctor and she never mentioned it to me. It was only by a systematic and careful examination that I found there was this umbilical hernia.

I then began to doubt whether she had ever had gall stone colic, and thought it possible that her trouble had arisen from strangulation or obstruction of the hernia. Accordingly I operated upon the hernia for a radical operation and closed the ring. I then made an incision over the gall bladder. It was free from stones and so were the ducts, but there were adhesions of the liver to the lateral wall and the diaphragm. These adhesions, which showed the previous existence of perihepatitis, were broken up with my hand and the wound closed. The woman had had pain in the region of the right lobe of the liver before operation. This pain was absent after operation. I don't know the present condition of the patient, but believe she will continue free from pain. If she had severe trouble I should probably have heard from her.

Dr. R. W. Corwin—I should like to report a case I was called to see in consultation with Dr. A. A. Corbin, of Pueblo. The patient was a woman 56 years of age. She was suffering from sarcoma of the pelvic organs and died a few days after I saw her. At my request consent was obtained to do a post mortem, which was performed by my assistant, Dr. C. O. McClure. There was nothing unusual found in the diseased pelvic organs. When the liver was examined the gall bladder was found to contain calculi.

Dr. Corbin had been the patient's family physician for two years. During this period the patient never complained of hepatic

trouble and but once of constipation. She had been a large, strong, and apparently healthy woman until less than a year previous to her death when she applied to her physician for relief from sarcoma.

The gall bladder was carefully removed and later opened and contents preserved. The calculi completely filled the bladder; not enough moisture remained to cause more than a few of the stones, although small, to adhere to the lining surface.

The calculi were counted and they amounted to the astounding number of 30,100. They were spherical in shape, varying in size from a pin head to that of a French pea. They nearly filled a four-ounce bottle, and weighed two and three-fourths ounces.

Dr. L. Freeman—In this connection I wish to call attention to a case which is perhaps unique, and which bears upon the question of diagnosis. I think one should report one's failures as well as one's successes.

Some time ago, in consultation with Dr. J. N. Hall, of Denver, I examined a man who had suffered for years with intermittent abdominal pains in the epigastric region with occasional intestinal occlusion. No jaundice. The painful attacks began and ended suddenly. The man was greatly emaciated, which helped to bring into prominence a large, tense, fluctuating tumor, occupying the space between the ensiform cartilage and the umbilicus, and reaching from the outer border of the right rectus muscle to the vicinity of the splenic flexure of the colon. The urine contained some bile. Secretion of stomach normal.

The stomach was washed out and emptied, which made no difference in size or condition of the tumor. No bile in the stomach, and the patient had not had bilious vomiting. The colon was dilated with air and found to curve sharply around and below the tumor. This was thought to explain, possibly, the temporary intestinal obstruction.

An aspiration made by Dr. Hall with a fine hypodermic needle revealed bile. An operation was at once made. A longitudinal incision through the right rectus muscle at once exposed a tense, fluctuating sac so surrounded by adhesions that its internal outlines could not be traced. By aspiration a quart of bile was withdrawn. There seemed to be no admixture of other

ingredients. The sac was then freely opened. Its internal boundaries could not be determined with the finger. On the posterior wall of its cavity was an opening the size of a knitting needle through which issued great quantities of bile. The opening was dilated with difficulty and another quart of bile obtained. The boundaries of this second cavity could not be determined.

It was presumed that as there was no jaundice the common duct could not be closed, and, as bile flowed in such great quantities from the wound, the cystic duct must also be open; hence it was thought wise to simply drain without further interference, especially as the man's condition was bad. A large rubber tube was inserted through the first cavity into the second.

The patient reacted well. For some days nothing abnormal was noticed. Great quantities of apparently pure, blackish bile flowed into the dressings. At the end of about five days some food came from the drainage tube, and the patient shortly died with symptoms of the intestinal obstruction which he had had before.

An autopsy revealed the fact that I had opened the stomach instead of the gall bladder. This in spite of the fact that the stomach had been washed out and found to contain no bile; in spite of the fact that the emptying of the stomach did not influence the size of the tumor; and in spite of the fact that the sac which was opened contained two quarts of apparently pure bile. The gall bladder was small in size and contained many stones. Stones also filled the common duct. The lesser peritoneal cavity was filled with bile.

The explanation of this complicated condition is probably this: A stone had caused ulceration of the common duct, admitting bile into the lesser peritoneal cavity. This was the original cause of the large tumor. Just before the operation, or during it, this bile by some means found its way into the stomach and duodenum. Thus, although the tumor seemed to be unchanged externally, its internal course was different. The small opening which I had dilated in the posterior wall of what I supposed to be an enormously dilated and extensively adherent gall bladder was really the pylorus, and the second cavity was the distended duodenum.

Why no food passed from the opening into the stomach for so many days I do not know. The intestinal obstruction was caused by adhesions of the colon.

The circumstances were so peculiar and so misleading in this case that it is difficult for me to see how I could have acted differently from what I did.

Dr. E. R. Axtell—There is just one point in the diagnosis of gall stones that has not been touched on, and I think we can dwell on it for a moment with some profit, and that is the point that the jaundice which occurs in cases of gall stones is occasionally of very short duration. I remember a case of gall stones in a young girl in which the diagnosis was very obscure because jaundice had not been discovered at any time. Late during an attack of hepatic colic I saw her, and she was decidedly jaundiced at this time. The conjunctivae were yellow and the face and hands were yellow, although the skin of the body presented no yellowness. It was at 9 o'clock a. m. that I first saw her. At 4 o'clock, on visiting the patient with a consultant, there was no jaundice at all. The sallowness which she ordinarily presented was just a little deeper than usual. This point in the diagnosis is worth consideration. We know that bile salts are deposited quickly, and there is no reason why they may not be absorbed quickly. The presence of this temporary jaundice aided me in making a diagnosis in the case of the young girl, as well as in a case in which the diagnosis had been made from floating kidney to gastritis.

Dr. C. A. Powers—We have all been much interested in these excellent essays which have been read. I would like to emphasize the assertion made by one of the readers that the diagnosis is often by no means easy; that the differential diagnosis, for instance, between an acute inflammation of the gall-bladder and an appendicitis—in the early stages—is very often impossible. During the last four weeks it has been my fortune to have seen two cases in each of which the attending physician, a most competent man, made a diagnosis of acute appendicitis, and I was inclined to agree with him. But on exploration, in each instance, there was an acute inflammation of the gall-bladder, due to the irritation of stones and consequent infection.

One of those cases was of exceptional interest. A woman of about 38 years, at the end of thirty-six hours was in a most urgent condition; a temperature of 104° and pulse of 140 to 150; agonizing pain, pain not to be controlled by morphine—a grain of morphine in twelve hours had practically no effect on this pain. This patient was seen with Dr. Bonney and with Dr. Bagot, and we all three felt that it was *probably* an appendicitis. The entire right side of the abdomen was exquisitely tender and very rigid. The entire right abdomen was rigid, well down into the right iliac fossa. The point of most exquisite tenderness, however, seemed to be midway between the gall-bladder and the appendix, and that fact led us to feel the possibility of an infection of the gall-bladder. When the patient was under anaesthesia no tumor was to be felt. (I might say that before operation the abdomen was so thick and so rigid that deep palpation was very unsatisfactory, but under anaesthesia no tumor could be felt.) I therefore felt it wise to make the incision midway between the site of the gall-bladder and the normal position of the appendix, through the rectus muscle at its outer portion. A small opening into the peritoneum allowed one to put a finger in; sweeping downward in the direction of the appendix nothing was felt; upward in the direction of the gall-bladder, one found a small, very dense tumor. The incision, therefore, was enlarged upward and the inflamed gall-bladder brought into the wound, there fixed, opened, and something like an ounce and a half of pus evacuated; the lower part of the incision was closed, the upper part left with the gall-bladder fixed in it.

The other case was very much like this except that under anaesthesia a fair-sized tumor was felt considerably below the normal position of the gall-bladder. An incision over the tumor itself came down directly upon the gall-bladder, its walls being very much thickened. The walls were three-quarters of an inch in thickness. This case was managed in the same way; each recovered.

As to the best incision for the gall-bladder or the bile ducts, there seems to be at present a bit of difference of opinion. I have not had occasion to employ the S-shaped incision recom-

mended by Bevan, but his papers have certainly tended to show that it is a very excellent one. Personally I have been inclined to make the incision through the rectus muscle itself rather than at its outer border.

Dr. W. W. Grant—There is one feature in connection with these operations about which there is also not a perfect agreement as well as about the incision, and I allude particularly to the question of attaching the gall-bladder to the abdominal wall and drainage. If the gall-bladder is much distended it can be readily brought to the surface of the abdominal wall, sutured, and drained in that way. But in many cases of gall-stone and possible pus the gall-bladder is contracted, and in these cases it is impossible to bring the gall-bladder to the abdominal wall and it must be emptied, sewed up, and left in its normal position or attached to the intestine. After all, much depends upon the discriminating judgment of the surgeon in each individual case.

As to the incision through the abdominal wall, there is one called the "S" incision, which is advocated very enthusiastically by Dr. Bevan of Chicago, in which, whenever it is necessary to continue the exploration and there is not sufficient room through the ordinary straight incision, he simply continues the straight incision at the top, curving it to the right and at the bottom or lower end curving it to the left, making a perfect "S" incision, and this, it is claimed by those who have tried it, gives a more perfect view of the abdominal cavity in this region and permits of more thorough exploration than the angular or straight incision.

When it is necessary to remove a stone from the common duct, about which Dr. Parkhill has spoken so interestingly, there is nothing to do except to remove this stone from the duct by incision, sew it up, and leave it without drainage. That is considered the best treatment.

Dr. E. Stuver—We have had a most excellent resumé of the surgical treatment of cholelithiasis, but I have not as yet heard anything concerning the medical treatment, which is a matter, I believe, that would interest the general practitioner. I know of no case that demands more prompt and radical re-

lief than the suffering caused by gall-stone colic. Of course, the ordinary treatment for relieving the pain in cases of this kind is generally the hypodermatic injection of morphine and atropine. I have treated a number of cases, however, by the olive oil treatment. I combine the olive oil with about fifteen minims of chloroform to each dose, and administer an ounce of the oil with this amount of chloroform each hour until results are obtained. I have obtained very good results from this treatment. I recently had a case of very severe gall-stone colic in which two doses of this olive oil and chloroform produced prompt relief of all the symptoms which had failed to yield to repeated hypodermic doses of morphine and atropia.

Dr. E. J. A. Rogers—I would simply like to explain, Mr. Chairman, that the point brought up by Dr. Grant of cases when the gall-bladder can not be brought into the wound was dealt with in that portion of the paper I was unable to read. I touched upon that point, and what Dr. Grant has said is quite covered in the paper, but it was very well brought out by him.

RELATIVE INFLUENCE OF DIET ON INTEMPERANCE.

BY B. A. ARBOGAST, M. D., BRECKENRIDGE.

We find that the health and strength of man must be kept up by a suitable aliment, properly prepared so that it is easily assimilable. Therefore cookery is so allied with our subject that it can not be passed by. Both daily experience and chemico-physiological observation show us that the best kinds of food contain both fat and carbo-hydrates in addition to albuminous matters. Instinct teaches us to combine highly amylaceous foods with fats, as the mixture increases the digestibility.

Unfortunately, we have no data for determining the correct proportions in which the different nutrient groups should be combined to form the food best suited to the general wants

of the organism, human milk being the nearest, and that varying so much in different individuals that we only approximately determine its component parts, which are:

10 parts plastic or blood-forming matter;
10 parts of fat;
20 parts of a carbo-hydrate;
0.6 parts of salts;
balance, water.

It appears quite often that in adult life a lesser ratio of plastic matter would probably suffice; and, again, age, sex, climate, and habits of the individual have such a controlling influence that we can only approximate.

The best brains of all nations have from time immemorial been devising the best food for their armies, and all nations are agreed upon only *one* proposition yet, viz.: that the soldier to have good health must have not only good and wholesome food, well cooked, but must have frequent changes of diet.

We also see in our every day experience with "bottle-fed" children that no matter what prepared food we use the child will thrive and grow for a time, when a change becomes necessary to keep up the health of the little one. Scurvy is the same,—the purpura is not from eating salt food continuously, or other food, but from the constant use of one kind. The human economy requires frequent change and variety of food to keep the organism healthy.

All foods possessing an organized structure, as animal flesh and amylaceous substances, require to be cooked, the only exceptions being the oyster and some ripe fruits. Therefore we have no doubtful suggestion to offer. The plain or common people of all countries (our own not excepted) live on one kind of food almost the entire year and *every* year, a change being the exception. A trip through the homes of the lower classes of our cities will convince any observer, after seeing the almost universally anaemic, rickety, and squalid conditions of the children, that it is especially a lack of proper food, properly prepared, which is the cause.

It is also not necessary to state to this society that with the higher classes the same conditions exist under another name,

viz.: pastries, pudding, canned goods, midnight teas, etc.—at unseasonable hours for even that!

It is a well-known fact that a vast majority of our criminal classes comes from the lower stratum of our society, who are poorly and improperly fed with improperly prepared food, and then declared criminal because he or she had imbibed a "drink" when that was the only thing that, as a narcotic, would relieve and benumb the physical nature suffering for want of food—food that nature needed!

It is well known and freely admitted that any of the narcotics only relieve a present want, and that afterwards the "conservation of forces" must be re-established by the only known law, viz.: rest, abstinence, and proper food for the restoration of the natural or reproducing functions of the organism.

Intemperance is only considered and thought of as a too free use of liquor of some kind, or other narcotic; while I believe it to be a *result* of the improper aliment for the tissues furnished instead of that intended.

The proper formation of tissue is achieved only through the natural and only way—food; then extra stimulus will not be required.

ABORTION: ITS SEQUELAE AND TREATMENT.

BY P. J. McHUGH, M. D., FORT COLLINS.

I have chosen for my subject "Abortion: Its Sequelae, and Treatment," first, because of its frequency, and, second, because we as physicians can not know too much about it. A very large percentage of women who suffer from female difficulties, when interrogated as to the cause of their trouble, usually refer to it as beginning after an abortion.

Abortion is usually applied to the expulsion of the uterine contents prior to the fourth month of pregnancy, in contradistinction to miscarriage and premature labor, which terms

are applied to delivery after the third month and up to full term labor.

Statistics give it that one out of every twelve pregnancies ends in abortion and that ninety per cent. of child-bearing women abort once or more during their lives. It appears to me that this is a low rate. Many abortions occur that physicians do not hear of. Frequently women pass the usual time for their periods and in the course of five to nine days begin to menstruate. Such delays are most frequently due to conception. The body of the uterus is under the influence of the great sympathetic nervous stysem and has a rhythmic wave. The cervix is under the influence of the cerebrospinal system, and is quiet, and acts as a guard to the door, if you will, of the uterus. The presence of gestation, in many women, stimulates the rhythmic activity of the body; paralysis of the neck, as a result of the presence of the pressure from above, takes place, and an abortion is the consequence.

Many such women continue to abort, time after time, without knowing that such took place, and, even if they did know it, frequently evade the physician, and no record of the abortion is extant. I have frequently explored uteri and found manifest evidences of an old abortion, such as hydatiform moles, etc., and almost as frequently found the woman ignorant of the occurrence of an abortion; hence I claim that abortions are much more frequent than the above quoted statistics would have us believe.

Abortions are much more dangerous than full term labor, because the former is unnatural and the latter a physiologic process.

The causes of abortion are manifold. I know one woman who has aborted three times, each time at the end of the third month. She never gave birth to a full term child, and is very anxious for offspring. On careful examination after the last abortion I found a typical infantile uterus. Such uteri most invariably expel their contents before the fourth month. Abortion is most likely to occur about the time of the regular monthly period, or when the activity of the automatic menstrual ganglia is at its height. Then the vascular supply and the muscular

disturbance of the uterus is greatest, the physiologic tension highest, and the contractions naturally strongest.

Most abortions occur about the end of the third month. It is then that the placenta is developing and a greater bulk is created for the restless walls of the uterus to contract upon. The placenta is frequently diseased, a pathologic condition often shared by the ovum, resulting in its death, and this again in abortion. Women with very sensitive nervous mechanism are frequently the victims of abortion. Strong emotions will induce its occurrence, as will toxic agents in the blood such as carbonic acid gas, the toxins of measles, scarlet fever, etc. Constitutional disease in one or both parents, men too young or too old whose constitutions are weakened by debauchery or disease, are likely to beget a foetus that is not fit for development.

Climate seems to play a part in producing abortions. In hot climates, where hemorrhage is more frequent, they are said to be more prevalent. Jourdanet says that in the mountains abortions are more frequent than in the valleys, and women in high altitudes are accustomed to resort to the valley to avoid them. I am not aware that our Colorado women living in the Rocky mountains are thus affected, or that they are accustomed to resort to lower altitudes for the purpose of preventing abortion. Diseases of the uterus and its appendages are frequently the causes of abortion. The following may be cited: Metritis, endometritis, interstitial and submucous fibroids, polypi, versions, flexions, organic disease of the cervix and body of the uterus. Adhesions of the broad and round ligaments, of the tubes and ovaries, by their interference with the development of the uterus, may induce abortion; as may also inflammation of the bladder and the rectum, pelvic tumors, and pelvic deformities. Metritis may lead to abortion on account of the inability of the diseased uterine wall to expand with the development of the ovum. Endometritis frequently leads to disease of the placenta and in this induces abortion. In the atrophic stage of endometritis, abortion takes place from the want of proper nourishment for the foetus. Displacements of the uterus lead frequently to abortion because endometritis and metritis frequently complicate them.

Byron Robinson says: "I think we may place gonorrhea among the very frequent causes of abortion. It starts as an endometritis, which seldom subsides without leaving traces of destruction and chronicity in its wake. Syphilis makes, so far as I can see, a more profound impression on the general professional mind, but it does not destroy one-fifth as many as gonorrhea. Syphilis is curable, but gonorrhea is not."

All stout women are inclined to abort. Mundé, Olshausen, Heger and Kaltenbach consider old lacerations of the cervix a frequent cause of habitual abortion.

"Mechanical violence such as blows, falls, violent exertion, excessive venery, sea bathing, irritation of the mammae, tooth pulling, etc., or emotional violence, as excessive fear, grief, joy, or anxiety are exciting causes of abortion."—King's Manual of Obstetrics.

The symptoms of abortion vary as to the stage of pregnancy and according to whether the foetus is alive or dead. In the early weeks of pregnancy the symptoms of abortion are hemorrhage, often no more blood being lost than during the menstrual period, followed by a few colic-like pains which suffice to expel the ovum. The abortion at this time is due, not to uterine contractions, but to a congestion which is followed by hemorrhage, the hemorrhage resulting from rupture of the decidual vessels. Occasionally the process of expelling the contents of the uterus is prolonged. Shreds of mucous membrane or decidua are passed from time to time, accompanied by hemorrhage and contraction-like pains. The uterus remains patulous until the process is complete and then returns to its normal form, consistency, and size, the time required for this process being about a week. Abortions occurring during the first or second month have, however, different symptoms. When the ovum is alive hemorrhage is a prominent symptom, and, as a rule, the first symptom to occur. It is due to rupture of the decidual and placental vessels. The blood escapes into the uterine cavity and destroys the union between the ovum and the uterus. It is much more pronounced than the hemorrhage that sometimes occurs in the earlier weeks of pregnancy. With the flow of blood the contractions of the uterus are ushered in. The con-

traction and dilatation give rise to a dragging sensation in the lumbar and pelvic regions, which become sharp and cutting pains as the uterine contents are forced down against the cervix. The hemorrhage is now intermittent, coincident with the uterine contractions; the more intense the latter, the more severe the hemorrhage. On digital examination, the cervix will be found patulous and dilated, the ovum lying within the internal os or in the cervical canal. Usually, from the force of the contractions, the ovum with its membranes is expelled complete; but less frequently the membranes are ruptured, the ovum expelled, and the placenta remaining. If the abortion is the result of criminal interference, and the life of the ovum recently destroyed, the hemorrhage may be excessive and even dangerous, especially if the act of expelling the contents of the uterus has been delayed for any great length of time.

In a number of cases the abortion is divided into two periods. The ovum is forced down by the uterine contractions into the cervical canal and becomes lodged therein. The contractions now cease, and in some cases the ovum returns to the body of the uterus. On resumption of the contractions the foetus is expelled first, the remainder of the ovum following only after the lapse of several hours or days. It is in this class of cases that the most dangerous hemorrhage occurs. So long as the placenta remains, the life of the woman is in danger. From the tenth week to the fourth month the abortion is different from the last period discussed. It is invariably divided into two stages, and sometimes into three. The placenta has developed, and is relatively larger than the foetus. Its attachment to the uterine walls is much firmer than in earlier foetal life. The musculature of the uterus is still in a rudimentary state and the contractions are not sufficient to detach the placenta. Hence the abortion is, as a rule, prolonged. The contractions force the ovum down into the cervix, the membranes under the pressure become ruptured, and the embryo is expelled. The physician on being called at this time may frequently find the embryo still attached to the placenta by its slender cord. This ends the first stage of the process. The os, which is unyielding as a rule, closes down and the placenta is retained. Another

labor is required for its delivery. Owing to its large size, to the unyielding condition of the os, and to the weakness of the contractions at this stage of uterine development, the process of its delivery may take a number of days. Not only days may elapse before the abortion is complete, but I have seen weeks and months. Frequently, on examination, the placenta will be found in the cervical canal, the uterus making every effort to expel it. If the placenta is completely detached, the hemorrhage will be very slight, but if partially detached, the hemorrhage will continue until its completion. As a rule, on expulsion of the placenta a severe hemorrhage is experienced. This completes the second stage of the abortion, and is usually the last but not necessarily so. "Occasionally the decidua, which at this period of gestation is still a living membrane, is passed off, making what might be called a third stage of abortion."—Charpentier.

The chief dangers resulting from abortion are hemorrhage and infection. The former rarely destroys life, but if prolonged and exhaustive is liable to leave behind it much debility. Infection, however, is the cause of the loss of many lives after abortion. It is due, invariably, to the presence of a portion of the placenta remaining in the uterus after the abortion was supposed to be complete.

Right here I wish to state that all cases of retained putrid placenta do not produce septicaemia. I have frequently examined the discharges from uteri the stench of which was very offensive without being able to find the micro-organisms of septicaemia; the patient, notwithstanding, having had a chill and some fever, though this fever is for the most part innocent, and ends after one or two weeks or following a thorough curetting of the uterus, without giving further trouble. The inflammatory effects of this condition on the organs adjacent to the uterus are very mild, although functional derangements of the liver, stomach, and kidneys may be very pronounced; the alterations in the retained placenta are purely chemical in nature and consist in the production of alkaloids having a very penetrating odor.

With the presence of septic germs the conditions are very different. In the midst of the most pleasing progress

a chill or a series of chills, followed by high fever, headache, and vertigo, with marked nervous depression, strike terror to the friends of the family and the physician, if there be one in attendance. Twenty-four to forty-eight hours may suffice to destroy life. At other times the progress is less rapid. It may continue from week to week and from month to month and finally end in recovery or death. The lochia become serosanguinolent, blackish in color, and have a sickening putrid odor. Metritis, metroperitonitis, or pelvic cellulitis may supervene with all their attendant symptoms, and, should death occur, metastatic abscesses, due to mixed infection, may be found in the liver, lungs, and other organs.

This subject would not be complete did I not enumerate some of the sequelae of abortions which are blindly effected by many thoughtless and imprudent women, and, I reluctantly state, by many physicians whose consciences are smothered by their desire to make money and retain their patients, and whose conceptions of right and wrong are only measured by their lack of regard for human life and health.

The streptococcus pyogenes, the micrococcus of puerperal metritis, has been proven to be a very widely distributed pathogenic micro-organism. It has been found on all the exposed mucous surfaces—mouth, nose, vagina, etc.—of healthy individuals. Open sores are a favorite culture soil for this growth. After the decidua or placenta is torn from the uterine walls, there remains a surgical wound of great magnitude. The germ may be conveyed to it from the hands of the patient herself, who from her own standpoint of knowledge often examines the parts to see how the abortion is progressing, by the attending physician who is careless in his asepsis, or by a septic vaginal syringe. Once the germ gains entrance to the uterus, more or less metritis and endometritis is sure to result. The inflammation spreads by direct invasion to the tubes. Bumm states that the germs traverse the uterine walls and only gain access to the tubes through their abdominal openings.

The left tube is more frequently infected than the right, probably because the lumen of the left tube is greater than the right. If the mouth of the tube is closed by adhesions, which

is likely to be the case, the lumen of the tube frequently becomes filled by a mucopurulent fluid, as a result of a salpingitis. If the distal end, or ampulla, be not closed by inflammatory process, the infection may be conveyed through it and a local peritonitis result. The process does not end here. The infection frequently passes through the peritoneum by continuity of tissue and sets up a cellulitis. The ovaries do not escape the general invasion. As a result of the peritoneal inflammation, bands of adhesion which bind the parts together are formed. They make pressure on the peripheral ends of the pelvic nerves and chronic invalidism or a neurotic tendency results. The neurosis will depend upon the extent and severity of the pelvic disease. The pelvic organs are supplied by the third and fourth nerves and the hypogastric and ovarian plexus from the great sympathetic system. Acute sharp pains are indicative of pressure and irritation of the former, and a dull continuous ache of the latter. Reflex disturbance of the digestive system occurs as a result of the nerve irritation. Indigestion ensues. The action of the bowels is interfered with from irritation of Meissner's plexus. As a result of indigestion the patient is improperly nourished. She becomes anaemic, weak, fretful, ill-tempered, and frequently a burden to herself and family.

Displacements of the uterus, in a vast number of cases, are caused by inflammatory affections following abortion. Sterility, in many cases, may be placed in the same category. Uterine hemorrhage, due to a portion of the placenta being left in the uterus, may also be a sequela of abortion.

Treatment: To guard against recurring abortions three things are necessary: a healthy uterus, a healthy mother, and the exercise of judicious care during the first four months of pregnancy, and especially during the time corresponding to the period at which previous abortions took place. Malpositions, endometrial disease, and syphilis demand especial attention in preventing recurrent abortions.

On taking charge of a patient who is threatened with abortion the first question to be settled is, has it advanced so far as to be inevitable. If the hemorrhage has been slight and the os not yet dilated, the probabilities are that it is not. Under

such conditions the patient should be put to bed and advised to remain there for three or four days after all symptoms have disappeared. Stimulants and hot applications to relieve pain should be avoided. Cooling drinks are beneficial. During the last four years I have used asparaline with satisfaction as a uterine sedative in cases of threatened abortion. Opium is a remedy of undoubted value in controlling uterine contractions.

When the abortion is inevitable, as evidenced by a dilated os and marked hemorrhage, I usually proceed at once to empty the uterus by manual extraction. After first making my hands and the vagina as aseptic as possible I introduce the index finger, and if possible two fingers, into the os, at the same time forcing the uterus down with the other hand by pressing upon the abdominal walls. By a gradual twisting and at intervals a pulling motion, the whole mass, in the great majority of cases. is removed intact. Occasionally, however, the ovum is ruptured. and the embryo comes away leaving its appendages behind. These I remove, either with my fingers or with the blunt spoon curette and the fenestrated placental forceps. Where the hemorrhage is great and the cervix contracted, I occasionally have recourse to the tampon. I am, however, somewhat prejudiced against its use, for the reason that a well packed tampon is an uncomfortable article in the vagina and frequently after its use the abortion has not materially advanced. In incomplete abortions, where the cervical canal has contracted and imprisoned the membranes after the embryo has been expelled, or where remnants of the membranes alone remain, what should be done? In such cases I never wait for the uterus to empty itself. I think it criminal practice to allow broken membranes to remain in the uterus until a chill followed by a fever compels their removal.

To remove them my practice is about as follows: After boiling my instruments I place the woman on the edge of the bed with thighs and legs strongly flexed. A hot antiseptic vaginal douche is now given. I introduce a Sims' speculum, seize the anterior lip of the cervix, and pull the uterus down. I then introduce a probe to ascertain the length and direction of the uterine canal. After dilating the os sufficiently, with a blunt

spoon curette I go over the whole internal surface of the uterus, loosening and bringing away the contents, all the time exercising care not to perforate the uterus or injure its walls. When the membranes are loose I use a pair of placental forceps to bring away any parts that remain. While it is hard to be certain that some remnants do not continue to cling to the placental area, it is surprising with what satisfaction the trained hand can lay down the curette and feel certain that the work is completed.

After abortion I always irrigate the uterus with hot sterilized water or salt solution, and if a septic condition exists I swab it out with Calvert's solution of carbolic acid, 95%. If the patient is in charge of a nurse who understands asepsis, I order hot vaginal douches once or twice a day and rest in bed for at least one week.

DISCUSSION.

Dr. C. B. Van Zant—It seems to me that there is no subject which could be brought before us of more practical or greater interest than the very one which has just been presented. I question whether there is any field of medicine or surgery in which so much neglect and almost criminal carelessness exists on the part of the physician in attendance as in the treatment of abortions. Very early in my professional life, in an eastern city, I had this matter so forcibly impressed upon me that I have never forgotten the lessons which I then learned. The city was largely composed of a foreign population, and fully two-thirds of the obstetrics and care of abortions fell into the hands of dirty German, Russian, and Italian midwives. The consequence was that we physicians had these cases falling into our care, at second-hand, in a most deplorable condition—sepsis, hemorrhage, fever, and everything which would make a clinical picture of a most horrible character; and from these experiences I have been impressed with the lesson that we can not exercise too much care, from beginning to end, in the conduct of these cases, either of criminal abortion or of abortion following natural causes. I was there struck also with the peculiar view which seemed to

be held by many of the older physicians. I recollect in one case meeting a physician of very large experience in a case of this sort, where he blandly informed me, after my protestations against any further carelessness or procrastination in the case, that for his part he had never seen a woman die of hemorrhage as the result of abortion, and he preferred to let it take its course and work the end out in its own way. I fear that that sentiment too largely prevails in certain directions in the profession to-day; or, if it is not this spirit of carelessness, we shall have to ascribe their action either to ignorance or a desire simply to avoid unpleasant work.

There is one thing in the paper which in particular I most heartily approve, and that is the use of the finger in the treatment as well as in the diagnosis of the case. I believe that no man, no matter what his accomplishments, can say positively, after he has curetted a case of abortion or used the so-called placental forceps, that he has a clean uterus. I have heard the very best men here in Denver acknowledge in society meetings that they have curetted a uterus thoroughly and to their complete satisfaction, and then say that when a subsequent hysterectomy had to be performed they found the interior of the uterus filled with a mass of offensive debris. Consequently, we can not rely upon the use of the curette nor upon the use of the placental forceps and feel that we have accomplished what it is our plain duty to accomplish. Therefore I feel that in all cases, whether we have been compelled to use the curette or not, we do not deserve a good night's rest if we have not subsequently introduced our finger into that uterus and swept it over every portion of the surface and convinced ourselves that we have an absolutely clean uterus; then only are we really justified in going home and lying down and feeling that we have accomplished the duty which was plainly placed upon us.

Dr. W. E. Wilson—I was much impressed with the paper that has just been read, both for its exactness and for the care which has evidently been taken in its preparation.

I am always more anxious when in attendance on these cases of abortion than in cases of labor at full term, and especially so when the foetus has been expelled and the placenta and mem-

branes remain in utero; and my solicitude is augmented if the os uteri has nearly or entirely closed, there being hemorrhages and fetid discharges. These cases are met with more frequently in women who have aborted and have had no medical attendant until, alarmed at the fever and possible fetor, a physician is summoned.

I saw a case not long ago where an abortion had taken place a week before without medical attendance; but after the foetus had been expelled, the secundines not coming away during the following twenty-four hours, a physician had been sent for. For four or five days he had been in attendance daily, but could not tell me whether or not the placenta had been expelled. As the patient objected to a vaginal examination none had been made. Insisting on an examination, I found the os patulous and holding a fetid placenta which was readily removed with the finger, the fetor being sufficient to arouse grave fears as to her recovery. With the aid of antiseptic uterine injections, however, she soon rallied from her dangerous condition.

I have found the tampon, either sponge or absorbent cotton, the best treatment where the os is undilated and rigid, as it guards against excessive hemorrhage in the absence of the physician. Under its use the os usually dilates in a day or two, when the placenta can usually be reached with the finger or forceps. Of course, the plug should be removed in eight or ten hours, both for antiseptic purposes and for information as to the progress made in dilatation. After the third or fourth month of pregnancy, when it becomes a case of miscarriage, the tampon can not be used so safely, as the larger the womb the greater the danger of internal hemorrhage; and certainly the vaginal tampon could not be safely used in post-partem hemorrhage, unless in cases where other means have failed, the uterine cavity having first been plugged with iodoform gauze or pledgets of cotton soaked in some antiseptic solution.

In obstinate flooding after delivery at full term, where life is greatly endangered, a powerful styptic, like a slightly diluted solution of the perchloride of iron, has been successfully injected into the uterine cavity to cause thrombosis of the vessels.

In Denver a small instrument is being placed in the os uteri of willing subjects for the purpose of preventing pregnancy. It is so constructed that the mouth of the womb is kept constantly open, and may succeed for a time in accomplishing its purpose, at least until the operator has had time to secure the "needful" for the operation. But how often inflammation results from the presence of the instrument or the frequency of its introduction into the os uteri of pregnant women no one can tell, for here mathematics is at fault on account of the secrecy observed generally by both parties to the contract.

Not long ago I related to a medical class my usual practice where I found ladies anxious to get rid of physical conditions abhorrent to their æsthetic tastes. The practice was simply to give a few dover's powder tablets of a grain or two each, one to be taken every four or six hours. One of the students, coming into the faculty room the next day, made diligent enquiries as to my precise mode of bringing on abortion with dover's powder. I replied that it would not bring on abortion at all, but would rather prevent it. A student who starts out with a morbid desire to know how to bring on abortion ought never to have studied medicine.

Much more care than is usually practiced should be exercised in the after-management of cases of abortion. More violence has been done to nature in many of these cases than in many cases of delivery at full term. The process of involution is, many times, imperfectly performed, and certainly as much rest should be insisted on as after delivery at full term.

Dr. Minnie C. T. Love—I am sorry the doctor's experience has all been with women students. I think some of us do try to prevent abortions. I would like to have brought out in this discussion, if possible, some means whereby we may diagnosticate abortion. It is perfectly plain and clear when the internal os is obliterated, and the external os will take the index finger easily, and the parts are all soft, and the woman has the history of having passed blood clots and been bleeding for some time. But in the cases of abortion when the external os is rigid and there has been slight bleeding for some time, when there is no temperature and no history of passing of clots, only every other possible

indication that the woman is going to abort, the question I would like to have brought out is how long are we justified in allowing that woman's mental condition to go on in that way, and how are we to be fully satisfied as to when we shall curette that uterus—when we shall forcibly empty it? There are very many women in whom it will contract—the uterus will close down on the membranes—and nobody knows anything about it and the woman is in a very dangerous condition. Now if we put her to bed and give her morphine or give her opium for three or four days, trying to stop that pain, and keep her in that position for a month or two and finally have to curette that woman, aren't we doing her a very serious damage? Aren't there some signs whereby we can go ahead and curette her right then and there and have it all over with? I think it would be of great advantage if we could bring out those signs that we might rely upon—because there must be and there are such signs.

I would also like to ask the doctor if he uses chloroform in his curettements as a rule. I find that where abortion occurs early and the uterus is rather rigid I am obliged to give chloroform to thoroughly dilate; but where the foetus has escaped and when the membranes remain and the uterus is soft, I can usually dilate a little with the dilator and not use chloroform. I prefer not to use chloroform. I would like to have the discussion bring out these points so that we might benefit by this very good paper.

Dr. B. A. Arbogast—I want to state just two things. First, I want to stand by the altitude. The paper stated that the altitude had a good deal to do with this. I want to state it as a fact and leave it to the discussion and experience of the rest of you if more than ninety-five per cent. of all abortions are not criminal. The altitude has nothing to do with it. I live in one of the highest towns that there is in Colorado—not the highest but one of the highest—and I find that I have had more importunities and more reasons for refusing to produce abortions up there than any other one thing that I have had to do. All the accidents put together don't compare with the women that come to me wanting me to produce these things, and then the gynecologist gets his lick in and they call me a belly-ripper when I come to the other end.

Now, then, the technique of Dr. McHugh's paper was correct. I am like Dr. Hawes, of Greeley, in answer to Dr. Love's question What are we going to do. He broke his leg, we will fix it for him.

Dr. Love—The question was When do we know we have got to do it? When must we say to the patient, you have got to be curetted?

Dr. Arbogast—I won't curette them at all. They took the chances. Do what the country woman did when she got married, take what the good Lord sent her.

Dr. Love—If your conscience will let you do that, all right. Mine won't.

Dr. M. Harrison—This is a question, certainly, to be decided in the mind of the attending physician, judging from the conditions accompanying the case. If I had a case where the cervix was patulous, the pain and distress prompting me to believe beyond a shadow of a doubt that the woman would miscarry, I would not hesitate to relieve her of such distress as would be possible. First, I would have to know beyond a reasonable doubt that a miscarriage was inevitable, and secondly, if the pain was great, I certainly would endeavor to relieve it by removing the conditions. In regard to curettes: I curette with a wire curette and at the same time with a hollow curette. I endeavor to keep a stream of tepid 1 to 5000 bichloride solution in the womb all the while and wash out all of the secundines that it is possible to do.

The altitude does have a great deal to do with abortions, notwithstanding the gentleman to my left—Dr. Arbogast—argues to the contrary. I am satisfied from my observation that women who are in the habit of miscarrying from emotional conditions or otherwise are more liable to miscarriage in high altitudes than they are in low altitudes. I have been for about seventeen years in an altitude of eight thousand feet. Subsequent to that time, and for the past three years, I have been in a lower altitude, about fifty-six feet higher than Denver. I have had three patients brought down to me from the highest incorporated town in the civilized world. For the benefit of this gentleman, who lives in a high altitude, I will state that is the

town of Bull Hill. I have had some cases that did not miscarry from criminal purposes, but from emotional conditions; I have had them at Boulder under my observation and have tided them over the period of gestation and two of them have been delivered at full term. Now this prompts me to believe that altitude does have an influence and an effect upon those conditions. I have lived in altitudes of about 100 feet above the sea level, was born and raised there, practiced medicine there; however, I hadn't then as extensive a practice in this line as I have had subsequent to that time, but nevertheless I had something to do with it, and my observation in that altitude and in high altitudes has taught me that altitude does have its influence beyond the shadow of a reasonable doubt.

Dr. H. G. Wetherill—I regret very much that I did not hear Dr. McHugh's paper. The question in reference to the influence of altitude upon abortion is a very important one. If abortions are produced at higher altitudes any more commonly than they are in the city of Denver, it is certainly a very serious problem that the profession in this state has to meet. In this very dry climate, as the altitude increases the electrical conditions increase. We in Denver know that electricity has a great deal to do with the production of abortions in this city. I do not refer to atmospheric electricity, but to certain other forms of electricity that are dispensed in some of our large business blocks. The induction of abortion as a business in the city of Denver is a very common thing indeed. The governor of this state has assumed a tremendous responsibility in his veto of the medical bill (great applause) because by that veto he has permitted the practice of medicine by these quacks and electricians who are responsible for the loss of many lives from year to year. No one knows this better than the operating surgeons of the city of Denver.

I want to allude to a point that has been made by Dr. Van Zant, that is, the necessity for the use of the finger in the uterus after abortion. I know of two or three instances in which the uterus has been carefully curetted by men who were capable of doing the work well, and a foetus has been left in the uterus, escaping the curette. In order to obviate this difficulty one of

two things is necessary—the use of the finger, or the use of the placental forceps or the curette forceps. If the forceps are used, large masses are not likely to be overlooked and left in the uterine cavity. If the finger is used of course such an accident would not be likely to occur.

In regard to the diagnosis of abortion: The most important differential diagnosis is that between abortion and extra-uterine pregnancy. Since this meeting began, I think yesterday, a gentleman told me of a case of extra-uterine pregnancy that he had seen; the woman had been bleeding and had all the signs of abortion. Her uterus had been curetted, and finally it was determined that an extra-uterine pregnancy existed and she was sent to the hospital and operated upon. The life of the patient was saved.

In regard to chloroform, I want to say just this: I do not believe that any thorough or proper curetting of the uterus can ever be done without an anaesthetic.

Dr. Sol Kahn—In regard to abortion in high altitudes: I live, I think, at quite a high altitude; I live in Leadville, which seems to me quite high. We have a great many abortions in our town, but when you consider the case—take each individual case, simmer it down, and study it out, you will frequently find that it is not a case of accidental abortion; and it is my opinion that abortions are not any more common in high altitudes than they are in lower altitudes—that is, abortions which have not been produced. I don't know about the proportion of abortions that have been produced. I suppose that our proportion is nearly as great as yours—at least we have a good many. I have expressed at different times some very radical views in regard to the treatment of abortions. I might have to modify them, but I consider that every case of abortion—by abortion I mean the expulsion of the product of conception previous to the viability of the child, whether natural or induced—that every uterus should be curetted irrespective of anything else; that temporizing is a very bad thing, and the gynecologist, I think, gets more cases which were carelessly handled cases of abortion than most anything else; that our cases of salpingitis and endometritis and a great many gynecological troubles are simply due to carelessness in

handling abortions. I am of the same opinion as Dr. Wetherill, that what is worth doing at all is worth doing well, and, in respect to curetting, we must curette under an anaesthetic. I have attempted on one or two occasions when I was alone to curette without an anaesthetic, but I came to the conclusion that I would never attempt it again.

Dr. W. J. Rothwell—I suppose this question of rich experience is of some value. I have had a great deal of experience with abortions and I find but little difficulty, as a rule, in telling when the uterus ought to be emptied. I generally give a hypodermic if the pains are severe, hoping that this will prevent abortion. If the pains return and hemorrhage develop, we are pretty well satisfied that abortion will take place. Now my method is always to put the patient under the influence of chloroform, dilate with the fingers, or with an instrument if I am compelled to but by preference with the fingers, and remove the contents of the uterus with the fingers. I have tried the curette, but I am never satisfied nor do I think any physician can be thoroughly satisfied that he has emptied the uterus unless he has felt all over the surface of the uterus with his finger. Now I have tried the curette, and I know from experience that I can not be certain of the result; but when the finger passes around the whole surface of the interior of the uterus, and nothing is found and you have removed the secundines, you know that you are safe. I do not believe any one can feel safe under any other circumstances. I have nothing more to say on that subject—that is, I do not wish to occupy time, as it has been well discussed already—but I wish to emphasize the fact that no young physician or old physician, no matter who he is, can be certain that the uterus is empty unless he has swept his finger around the inner surface of the uterus and found it smooth, and then he can tell that the contents have been removed.

Dr. McHugh—I am glad to hear from Dr. Kahn of Leadville in reference to abortions in high altitudes. As I said in my paper, I was not aware that women aborted more frequently in the high altitudes of the Rocky mountains than in the valleys, and his remarks have still further convinced me of this fact.

In reply to Dr. Love's question, I wish to say that it is hard for me in many cases to satisfy myself that abortion is inevitable. If the hemorrhage has been marked, the cervix patulous, and the os dilated, I regard it as inevitable. I also regard as inevitable those cases in which the os is rigid and the hemorrhage slight, but which keep up intermittently from day to day in spite of treatment.

In all cases, however, unless the signs are absolutely *in* favor of emptying the uterus, I use conservative methods, at the same time exercising a careful watch over my patient.

As to the curette, I have used it when necessary for the last seven or eight years and have found it a great aid to me in the treatment of cases of abortion. It is especially serviceable when the os is rigid and where sufficient dilatation to introduce the finger is hard to obtain.

With the placental forceps and the curette I have emptied very many uteri, and have yet my first case of fever following abortion to record.

RESECTION OF THE LARGE INTESTINES.

BY EDMUND J. A. ROGERS, M. D., DENVER.

No definite set of rules can be made for the procedure in abdominal operations, because no two cases are similar in more than outline, and one never knows in more than an uncertain general way what condition may be found when the abdomen is opened.

It is exceptional to be able to decide beforehand what the details of any given operation will be, or even what it may be necessary to do before any given case is completed.

We are also constantly being suprised by learning from results to what an extent we can beneficially remove and remodel the abdominal organs, through discovered conditions necessitating much more extensive mutilation than we expected.

I have recently been privileged to see two cases involving diseased large intestines which have seemed to me of sufficient

interest and importance to justify my reporting them to you with considerable detail. Although quite different in their pathology, the essential feature in each was the resection of a portion of the large intestines and their re-arrangement. I therefore report them together.

Mrs. J. M. A———, aged 49, the mother of thirteen children ten of whom are living, was brought into St. Luke's hospital from the mountains, near Morrison, on the evening of December 20, 1897, by Dr. A. D. McArthur, of Littleton, to whom much credit is due for his early recognition of the patient's condition and his prompt action towards relieving it.

The patient's previous health had been good, she having gained twelve pounds in the two previous months. Ten years before she had been jaundiced, and recently had been annoyed by constipation and hemorrhoids.

On December 17th, she had been taken acutely ill with pain in the bowels and tenesmus, but passed only gas and blood with some scybala. This condition continued into the 18th, when, after taking a cathartic, she began vomiting and became distended. Dr. McArthur was called on the 18th, and again on the 19th when he advised operation. She came into the hospital on the 20th, still suffering pain, tenesmus, tympanites, and still passing only gas and blood from the bowels. Her pulse had kept about 100, and the temperature 100 to 101 degrees. The abdominal condition was difficult to make out owing to the distention, but a tumor could be distinguished on the left side between the umbilicus and the anterior superior spine of the ileum.

A diagnosis of probable intussusception was made and an immediate operation undertaken. In the operation I was assisted by Dr. McArthur. I opened the abdomen by a central incision to find the peritoneum filled by a dark foul-smelling fluid. The tumor proved to be a much enlarged sigmoid and descending colon; it felt quite solid, and appeared almost throughout absolutely gangrenous. A longitudinal incision showed the mass to be made up of the thickened walls of the bowel which almost absolutely obliterated the lumen of the canal; along the attachment of the mesentery to the bowel there was a distinct line of demarcation separating the diseased and apparently dead peri-

toneum and bowel tissue from the living tissue. The diseased area gradually shaded off above in the descending colon and below in the rectum. The mesenteric glands were enlarged. The appearance gave the idea of an acute inflammatory process leading to or originating from a thrombosis of the veins of the area, and resulting in gangrene of the bowel. The upper portion of the rectum appeared fairly healthy although swollen, and I placed a double ligature around it as low down in the pelvis as I could reach. I also double ligated the bowel above, as near the gangrenous area as seemed safe to trust it, although still in swollen tissue. I then tied off the mesentery as short as possible and excised the intervening bowel, leaving the outside ligatures to close the opened ends. So much of the descending colon was removed that it was hard to find a place to make an artificial anus; so I forced my finger from within outwards up close to the margin of the ribs and as far posterior as seemed practicable, and, cutting through the skin over this point, separated the muscle fibres but cut none of them, and forced the peritoneum into the ring thus made. I then opened the protruding sack of peritoneum and drew the divided end of the colon into it by means of the uncut ends of the ligature binding it. To draw the bowel into the opening put it under considerable tension; and as its walls were still oedematous and looked fragile I did not dare risk suturing it to the margin of the opening, but, instead. drew it through as far as possible, and stitched the ends of the ligature into the skin toward the lumbar region some distance from the opening, thus holding the bowel in place and leaving it unopened. I then closed the central incision.

The piece of bowel excised measured seventeen inches in length and appeared about two and one-half to three inches in diameter when first removed. The canal was almost completely closed, but as it rapidly shrunk from loss of fluid the whole mass decreased and the canal of the bowel appeared more open.

The tumor was examined by Dr. Fenn, who pronounced the disease croupous colitis. I append his report.

I have here also the original bedside reports, which will interest any one who cares to study the details in such a case.

The patient did very well through the first night, but then developed considerable pain and fever. I was, of course, handicapped by the absence of a rectum to assist in stimulating and nourishing her. Upon the second day, I cut into the bowel to allow the gas to escape, but feared to liberate it from the ligature as the tension was still great. I was then able to introduce a tube through the artificial anus, wash out the bowel, and introduce fluid enemata. I allowed the protruding portion of the bowel to slowly necrose away and then cut out the sutured ligature. Gradually the bowel assumed the regular functions, but not before she had had stercoraceous vomiting and other serious symptoms. Convalescence was slow but progressive. It was somewhat impeded by inflammation about the central incision, where the tissues had undoubtedly been infected from the abdomen during the operation.

She remained in the hospital until February 2, 1898, when she returned to the mountains. I saw her once, some months later, when she feared a closure of the artificial anus. She then seemed pretty well, but stated that she had not regained her strength since the operation. The opening had contracted to a very small size, rendering defecation very difficult. A small probe was introduced and the opening slowly dilated with graduated sounds. I saw the patient only this once after she left the hospital. I am informed, however, that she died last fall, but can learn no particulars as the family removed to North Park where they are practically inaccessible.

REPORT OF DR. W. B. FENN.

* * * * * * *

A piece of large intestine with epiploic appendages and a small part of the mesocolon.

The mesocolon seems normal—no enlarged vessels or thrombi to be found.

The colon is very much enlarged, dark red, with some exudate on the mucous surface.

No ulcers found.

A section was taken from the middle of the piece toward the mesocolon, hardened in formalin and alcohol, mounted in celloidin.

The whole intestinal wall is thickened.

The muscularis is infiltrated with inflammatory cells and shows signs of necrosis in spots.

The submucosa is much thickened and is infiltrated with round cells and pus cells.

The mucosa is so infiltrated that its structure can scarcely be made out. On its free surface is a thick exudate made *up* largely of small round cells.

Diagnosis: Croupous colitis.

The subject of the second report is Mr. Edward C———, a stonecutter, aged 43, living and working in Denver, a patient *of* Dr. Bonney, to whom I am indebted for having been called to the case and who assisted me in the operation.

The patient's medical history is uninteresting until he first felt abdominal pain in 1895. These pains were not very severe and usually came on in the evening, but disappeared in about three months. In the spring of 1897, during a short attack of la grippe, they were again marked and continued some time. In November, 1897, while having a severe cold and coughing much, the pain first localized itself in the right side of the abdomen, and he began having black tarry stools several times each day. His appetite failed, and he lost some thirty-five pounds in weight. The pain was not very severe and was most marked when his bladder was full. During the early part of 1898, Dr. Bonney found a tumor in the right abdomen, but the patient would not stop work to give it attention, until too exhausted to longer continue about.

On August 10, 1898, he had a severe chill which prostrated him, and he entered the hospital on August 13.

A large movable tumor then occupied the lower right abdomen. It was so movable that it seemed probably connected with the omentum. The bowel movements continued, but they were not profuse and pain was not a marked feature, his chief symptoms being great exhaustion and prostration.

We opened the abdomen on August 16, along the median line. The tumor was found to be a large carcinoma, involving the caecum, part of the ascending colon, the omentum, and the transverse colon. The growth had evidently begun in the caecum and extended up and along the bowel. The omentum had later become attached to the mass, and had gradually contracted and drawn the right central transverse colon into the tumor, with which it had slowly become incorporated. At the same time the drawing had elongated the meso-colon on the right side and so rendered the tumor movable.

The right flexure of the colon was apparently healthy, but was, of course, between two diseased areas. The glands of the meso-colon were enlarged, especially the upper ones. The disease did not extend to any extent beyond the ileocaecal valve, but the small intestines were full of a semi-solid material suggesting the difficulty of passage through the tumor.

An attempt at removal looked almost hopeless, but without doing so the condition was desperate. The tumor could be easily raised and showed no posterior extension.

I first penetrated the omentum at the right end of the stomach and investigated the meso-colon of the flexure, to find no impediment to removal there. I then ligated off and separated the omentum, and freed and clamped the transverse colon beyond the tumor and then the ileum above the valve, and divided the bowel at these two places. The mass was now easily raised from below, and I clamped the layers of the meso-colon together as close to the vena cava as possible, and cut the entire mass away in front of these long clamps and removed all together, carefully taking all glands I could find. No attempt was made to separate the vessels in the mesenteric stump, the tissues being tied in successive massed ligatures. The tearing away of the peritoneum from these ligatures left a considerable portion of the posterior surface of the right abdominal fossa denuded, but I did not delay to attempt to recover it. I then closed the open end of what remained of the transverse colon, and as it had little superior attachment it was not difficult to approximate it to the end of the cut ileum and make an end to side anastomosis with a Murphy button. To do this, however, made such a sharp flexion

of the ileum and its mesentery that I was apprehensive of its strangulating, but it seemed more advisable than uniting the ileum to the sigmoid and leaving a long portion of closed colon above the anastomosis. The parts removed included about six inches of the ileum, the caecum, the ascending colon, about two-thirds of the transverse colon, and most of the omentum.

The tumor was pronounced colloid cancer by the pathologists. It is here for your inspection.

Recovery was very satisfactory. In twenty-one hours the patient began passing much flatus, and in forty-two hours the bowels began moving and continued doing so at very short intervals. Indeed for about three weeks there was quite a diarrhœa with black tarry stools, evidently the accumulated substance from the small intestines passing through the Murphy button.

The original bedside records are here, if any one cares to follow the details.

There was considerable variation in the symptoms, but general continued improvement.

The patient left the hospital on September 22, the button not passing until that date, thirty-six days after the operation. On leaving the hospital the patient weighed 140 pounds. He now weighs 195 pounds, and has for the past month been at work at his trade, and is now again doing regular stonecutter's work.

I need hardly say that it affords me much pleasure to be able to introduce to you to-day this more than ordinarily robust appearing man as one who has gone through so much.

DISCUSSION.

Dr. L. Freeman—I certainly want to say that I think Dr. Rogers really deserves this band of music that is playing on the outside.

Dr. John B. Roberts—It does seem to me that this case is one of much more than ordinary interest; that it must interest all of us much more than cases usually recorded of abdominal surgery. I know none like it except one reported some years ago to the British Medical Association by Dr. Shepherd of Montreal. which was similar in extent of bowel. I hope that an illustra-

tion will be drawn and put in the transactions, in order that it may have much more prominent position in literature than it can simply from the written report.

Dr. Rogers—I heard Dr. Shepherd make the report of his case. It was a very interesting one indeed. The length of the small intestine was immense, I think some sixteen feet, that Dr. Shepherd took out—almost all the small intestine—and the case was a very satisfactory one. I saw the boy and saw the specimen that he removed.

The astonishing thing to me in this particular case was the diarrhœa through the Murphy button. I think that is almost unique; that a man within two days after an operation should begin to have a profuse diarrhœa coming through a fair sized Murphy button was to me something more than astonishing, especially when I expected the intestine at that particular point to become strangulated.

RATIONAL TREATMENT OF GLEET.

BY JAS. M. BLAINE, M. D., DENVER.

The subject of gleet and its successful treatment is one of vast interest to every physician and also to a fair percentage of the lay population of our country. To most physicians it is the *bete noir* of their practice. To have an acute attack of gonorrhoea may be considered and often is "no worse than a bad cold," but to arise every morning for months or years and find the lips of the meatus urinarius hermetically glued together is a condition well calculated to drive a man to drink or self-destruction. So long as one is in this condition he is in constant danger of infecting others, and also of a recurrence of an acute attack.

By at least two of our recent text-books gleet is defined as being a gonorrhoea lasting more than ten weeks. This definition is misleading; for the terms acute and chronic apply to condition rather than time; and I have seen an acute gonorrhoeal discharge continue for more than thirty weeks.

The most comprehensive definition of gleet is "The chronic stage of urethritis, with muco-purulent discharge." This discharge is never very profuse and in most cases may only be seen in the morning, either as a drop expressed from the urethra, or a slight gummy discharge sufficient to glue the lips of the meatus together. The power of this discharge to communicate gonorrhoea diminishes in proportion to the duration of the gleet. In one case which I recently treated the gonorrhoea was communicated to two different parties by my patient when the gleet had been nothing but a "morning drop" for more than two years.

There are three pathologic conditions which obtain in gleet, and one of these is sure to be found on careful examination: either there is a leaky inflamed mucous membrane, a stricture, or a granular surface.

The first represents probably 10 per cent. of all cases seen and the other two probably divide the remaining 90 per cent. equally. In order to determine which of these three conditions is present I make use of the Otis sound in preference to the urethroscope.

A stricture is easily recognized by its resistance and can be accurately measured by the Otis instrument. The inflamed leaky membrane will show tenderness for a considerable distance, but the tenderness is uniform. The granular condition will show pain in one or more localized spots, usually not more than two, and often only one.

In reading the text-books on this subject one is struck by the multiplicity of remedies suggested, and the conviction naturally comes to the reader that where many remedies are suggested no one of them can be relied on as a *sine qua non*.

The rational treatment of gleet, or in fact of any disease, is to correct the pathologic condition and remove the maintaining cause.

To restore a leaky, inflamed mucous membrane to a normal condition one has recourse to the administration of tonics internally, the injection of astringents, the passage of cold sounds, the retro-injections of cold water, and electricity. In my own practice I prefer tonics and electricity. For this condition I use a weak galvanic current of say 1 or 1½ milliamperes. The application should be repeated once a week.

Where a stricture is present there are, as you know, three methods by which its removal may be effected. Neither method is applicable to all cases, and the operator must select the method best suited to the individual case. If the stricture is of recent formation the passage of steel sounds will usually suffice to break it up. Where it is old, well organized, and of small calibre, it should be cut. But in either case I finish the treatment by the application of galvanism. If the stricture is of moderate age and medium size I prefer galvanism from the start.

Where galvanism is used it not only leaves the surface smooth and even, but destroys any granular tissue which is almost sure to be found back of the stricture.

In the third variety of gleet where there is granular tissue, stretching and cutting will not avail, neither will internal medication or ordinary injections. The unhealthy granulations must be destroyed. Here two methods may be used, either the instillation of a caustic, or galvanism. The objection to the former is the difficulty of its application and the pain produced. To the latter I have as yet found no objection. I use for this purpose a strength of 2½ milliamperes for a period of five minutes.

The operation is repeated every fourth day, and the time necessary for a cure varies from one to ten treatments. In most cases I prescribe a mild antiseptic injection to be used after the application of electricity, and also see that the urine is kept as near neutral as possible.

The great advantage of this treatment is that it cures, and is in most cases painless.

In order not to unduly lengthen this paper I will only cite a few cases illustrating the varieties of chronic gonorrhoea and also the variation in time of treatment. Some of the cases read like quack testimonials, but they are taken from my own case records and not from the columns of the Denver daily press.

Case I.—This case properly heads the list, as it was while treating this case with the various remedies suggested by our text-books without result that I was forced to resort to measures not mentioned in any text-book on venereal diseases. The patient, Mr. E. S., called on me June 13, 1895, suffering with a well developed case of acute genorrhoea. During the next nine

months the treatment alternated from one plan to another. The routine internal remedies were given, and the local treatment embraced practically all of the astringents recommended in these cases, as well as a thorough trial of Keifer nozzle with hydrarg. bichloridum, and also retro-injections of pot. permanganate. In spite of all these the pus continued to flow in copious quantities for nine long and weary months. Then a change took place, the pus gave way to a gummy, glycerine-like discharge, which continued for another month unaffected by the usual remedies for gleet. As I was using electrolysis every day for the purpose of destroying excrescences on the skin surface, it occurred to me that electrolysis would destroy those granulations in the urethra. By using the Otis sound I located the patch of granulations in the middle portion of the anterior urethra, and with the insulated sound attached to the negative pole of my galvanic battery I applied two and one-half milliamperes for a period of five minutes. This strength of current was absolutely painless and was repeated every fourth day. After four treatments the discharge ceased, and to this day, more than three years later, his urethral mucous membrane has been perfectly healthy, proving not only that he was cured by this procedure but also that it produced no ill effects.

Case II.—Mr. G. W. S., age 24, came under my treatment on January 10, 1897. Had gonorrhoea eight months ago. Has had gleet for six months, and has recently communicated gonorrhoea to his *puella privata*, whom I also treated. Examination with Otis sound shows granular condition on lower third of anterior urethra. Applied negative galvanic current, two and one-half milliamperes, for five minutes every fourth day. In three weeks discharge ceased, and patient remained under observation for more than one year with no return of the trouble.

These two cases represent the granular type of gleet and the good results obtained by this method of treatment, and to cite the others that I have since treated with the same results would simply be a repetition of the foregoing.

Case III.—Mr. G., age 22, called on me April 15, 1897, with following history: Has had a gummy, glycerine discharge

in the morning for the past six months, following an acute attack of gonorrhoea. Patient is of a nervous temperament. Examination with Otis sound shows general tenderness of the mucous membrane of the anterior urethra. Applied one and one-half milliamperes for ten minutes to entire urethra. After first application patient left the city for a time, and on his return he reported that within a week after the application the discharge stopped. This quick result was a surprise to me, and at first led me to doubt its genuineness; but as he had suffered with a "morning drop" for six months and as he has had no return of it in the past two years, I feel justified in classing it as a cure.

Case IV.—Mr. J. J., age 35, called on me May 4, 1898. Had gonorrhoea three years ago; since that time has had an occasional "morning drop." Examination showed the lower half of the anterior urethra to be inflamed and tender. Applied one and one-half milliamperes for ten minutes. The operation was repeated two days later, as the patient was obliged to leave town. One month later he returned and reported the cessation of the "morning drop," and has had no return of the trouble since.

Cases III. and IV. are the only cases of gleet due to a leaky mucous membrane that I have had the opportunity of treating by this method, but I feel that these cases will yield just as readily to galvanism as those having a granular condition.

Case V.—Mr. J. B., age 30, called on me October 31, 1898. Two years ago had an acute attack of gonorrhoea; since that time has had a constant "morning drop." Recently he communicated gonorrhoea to his *puella privata* (whom I also treated). Examination showed stricture of medium size in the middle third of anterior urethra, and also one in lower third. Behind each stricture was a patch of granular tissue which accounted for the gummy discharge. Applied two and one-half milliamperes by insulated bulb one size larger than the stricture, passing it back and forth till it would pass either way with ease. Operation repeated every week. Patient given solution of pot. permanganate with instructions to inject twice

daily. At the end of three months all stricture tissue and granulations had disappeared and patient was highly gratified to note the absence of the "morning drop."

Case VI.—Mr. W. M., age 25, called on me April 8, 1899. Has had gleet for two years; sometimes there is a slight discharge of pus, but usually it is only a gummy discharge sufficient to glue the meatus together in the morning. Examination showed a stricture of small calibre just back of the glans penis. Immediately back of this there were three enlarged glands, the size of large peas, which could be felt along the line of the raphé. The stricture being too small to permit of any further examination of the urethra, cocaine was instilled and the stricture cut so as to admit a No. 16 American sound. Further examination revealed granular tissue in the prostatic urethra. An insulated sound with No. 15 American bulb was then applied twice weekly to the anterior urethra with a strength of two and one-half milliamperes. At the end of three weeks the stricture tissue had disappeared and also the enlarged urethral glands. Applications of the same strength of the galvanic current were then made twice weekly to the prostatic granulations, and by the end of the next three weeks the granulations had disappeared and the discharge ceased.

These two cases, I think, fairly represent the class known as gleet complicated by stricture, one treated by the combined method and the other by electricity alone.

Up to this point in the paper my hearers might justly conclude that this treatment never fails; therefore, in order to be perfectly honest in the matter, I will record one case of failure, which is the only one out of the many I have treated by this method.

Case VII.—Mr. B., age 35, called on me November 5, 1897. Has had gleet for three years and been treated for two years. Examination shows small spot of granular tissue in the middle third of anterior urethra and also a small patch in posterior urethra. Applied same strength of galvanism as in other cases, and also gave urethral tonics. Patient showed some improvement and the spot in anterior urethra disappeared, but at the end of six months he still had an occasional "morning drop."

One day he discovered an eruption (probably herpetic) on his penis and immediately placed himself under the tender mercies of a Seventeenth street quack, who not only makes a specialty of syphilis but makes syphilis out of every innocent eruption. The quack also failed to relieve his gleet, and for the past six months he has been under the care of one of our best surgeons. When I saw him less than a month ago he still reported a "morning drop."

My apology for calling your attention to this method of treating gleet is twofold: first, it is almost an absolute cure for this condition; and, second, our text-books on genito-urinary diseases are singularly silent on this plan of treatment. True, so far as I am personally concerned, the idea was my own and I made a verbal report of my success two years ago to the Denver and Arapahoe Medical Society; but after using this method for some time I found an article in the "International System of Electro-Therapeutics," by Dr. Robinson, of Albany, N. Y., on the same idea, which had been published before my experiments were made, but which I had failed to see. With apologies, therefore, to Dr. Robinson for thinking along the same line as he had written, I wish to again assert that the rational treatment of gleet consists in destroying the maintaining cause, and for this purpose galvanism is our best agent.

PROTARGOL IN THE TREATMENT OF GONORRHOEAL URETHRITIS.

BY HOBART E. WARREN, M. D., DENVER.

What is protargol? In the Derm. Centralblatt, 1897, I., Professor Neisser first reported its character and use.

It is a proteid compound, containing 8% of silver, presented in the form of a fine yellow powder soluble in hot or cold water with the aid of shaking. It has two very important characteristics in which it differs from other silver compounds:

1. In solutions of the necessary strength, 1/4 to 1/2 to 3/4 to 1%, it is non-irritating except in rare cases.

2. It is not precipitated by sodium chloride, dilute hydrochloric acid, or caustic soda.

The first characteristic allows:

A. The prescription of its use at once upon the presentation of a patient who has a urethral discharge which shows microscopically the presence of gonococci.

B. The long retention of the injection, five to thirty minutes, which brings about two desired results:

(1) A prolonged contact between the infected mucous membrane and the curative medium.

(2) After fifteen to twenty minutes retention, the spasmodic contraction of the constrictor urethrae muscle, which takes place upon the introduction of any foreign substance into the anterior urethra, passes away and the injection flows into the deep urethra, thus enabling a patient to treat his own posterior urethritis.

The second characteristic, non-precipitation, allows the protargol to come in direct contact with and to deeply permeate the mucous membrane, whereas a small amount of urine or pus in the urethra causes the precipitation of the silver in other preparations, thus coating the mucous membrane and preventing the unprecipitated portion of the injection from reaching the diseased tissues.

The exact germicidal power of protargol has been, to my knowledge, as yet only clinically demonstrated, but in this way most satisfactorily.

The characteristics mentioned govern to a large extent the methods employed in its use. Upon the discovery microscopically of the presence of gonococci in a patient's discharge, a 1/4 or 1/2% solution of protargol is at once prescribed, to be used as an injection for one week. The urine is to be passed and the urethra washed out with warm water before each injection. The morning and noon injections are to be retained for five minutes, the evening injection for thirty minutes. If it is not desired to treat the posterior urethra, six injections, each retained for five minutes, may be given in the evening. If it is desired to treat an existing posterior urethritis, the first injection should be retained for at least twenty minutes, for the reasons earlier

stated. At the end of the first week, the strength of the solution should be increased to 3/4%, at the end of the second week to 1%. Higher per cents usually cause undesirable irritation. This last per cent. may be kept up until the end of the fourth week, if necessary.

Repeated microscopic examinations should be made to prove the absence or presence of gonococci, which I have found to disappear usually at the end of from four to seven days. Three weeks usually suffices to eradicate the disease if the proper course is pursued, although a few cases present themselves which resist our efforts with this drug as they have with others in the past.

The literature on the subject and reported cases warrant the following conclusions:

1. Protargol is the best anti-gonorrhoic as yet known.

2. To be effective the injections must be long retained. Twelve cases which I have treated and shall later report have rapidly recovered, with one exception—a chronic case in which the injections were not long enough retained, but in which recovery at once followed the long retention of injections.

DISCUSSION ON THE PAPERS OF DR. WARREN AND DR. BLAINE.

Dr. B. A. Arbogast—I arise more for information than criticism. I have been treating strictures, but I have failed twice and I feel that I am going to fail again. Now, I want to know whether it is my fault or not. I had two old cases of stricture, and Dr. Warren here states that sometimes it is better to give injections at intervals of four or five minutes than one at thirty minutes, and I thought that I had probably introduced the catheter too often. At any rate, the poor fellows died and the other fellow I think is going to die. I am honest about the matter, you see, and I want to ask for information whether I have overdone it.

Dr. Warren—You mean in regard to the injections?

Dr. Arbogast—Yes, sir.

Dr. Warren—The injections spoken of were injections given with the urethral syringe, not introducing into the urethra other than the simple conical point of the urethral syringe, no instru-

ment being passed deeply into the urethra—if I catch your point rightly.

Dr. Arbogast—To make my point plainer—I broke up the strictures, then I used the injections, and I thought that I had overdone it. We can sometimes overdo the thing, and that is the question I am trying to arrive at. The poor fellows died. They got worse and worse and the more I did the worse they got. and finally they got into the ground.

Dr. Warren—The only thing I can say in answer to that is. my usual method, doctor, is to gradually dilate the stricture with Oberländer's dilator, used every three or four days, the patient at the same time using an astringent injection of zinc sulphate.

Dr. W. P. Munn—There are just two points in the papers that have been read that seem to me worthy of discussion by those who differ from them. In the first place, in reference to the use of galvanism in causing granulations of the urethra to disappear. I do not know that it has ever been claimed or proven that the application of galvanism will cause the granulations to disappear from any other ulcerating surface, either on the skin or the mucous membrane of any other tract, and I have very grave doubts of any report based upon the statement of the disappearance of granulations through the application of galvanism to the urethra. It is true, and many of us know from long experience, that some cases of granulation in the urethra are benefited by the repeated passage of instruments. In those cases where the application of galvanism has apparently done benefit I think it is not due to the use of the galvanic current, but to the use of the instrument. The simple physical contact of a steel instrument does something in crushing and breaking down these granulations so that ultimately a healthy repair process takes place instead of the ulcerations.

The second point in which I want to state a disagreement is in reference to only one word that Dr. Warren has stated. With the rest of the paper I agree most heartily. I can not accept any proposition that either the diagnosis or the progress of a case of gonorrhoea may have light thrown upon it by a stain with methyl violet or anything else which is not followed by the application of the discoloring fluid; that unless Gramm's

method is followed you are not able to tell whether a patient has gonorrhoea or whether he is getting better.

Dr. Melville Black—I hope I may be pardoned for intruding myself into the discussion, but, inasmuch as we do find gonorrhoeal ophthalmia occasionally, I think it possibly might be well to urge once more the necessity of the physician cautioning a gonorrhoeal patient upon the first opportunity as to the extreme necessity of absolute cleanliness of his hands and that they should be kept away from his eyes under all circumstances. These accidents occur, and the only reason they do occur is on account of the carelessness of the patient. They should be always thoroughly instructed on this point, and if they were there would be less gonorrhoeal ophthalmia.

The use of protargol has proved of great success in gonorrhoeal ophthalmia as well as in gonorrhoeal urethritis. It has not superceded nitrate of silver, but it is of a great deal of value after the application of nitrate of silver.

Dr. C. A. Powers—I believe galvanism is of absolutely no value in the management of strictures of the urethra. It is absolutely without honor in the home of the man who has done the most in this work, Dr. Newman, of New York. Some years ago a spirited controversy was held regarding the value of this measure, and at that time Dr. W. K. Otis in an open meeting of the Academy of Medicine proposed to furnish Dr. Newman with a certain number of strictures of the urethra, these to be examined and recorded by an impartial committee, and then turned over to Dr. Newman for management by his method of electrolysis. Dr. Newman has never seen fit to accept that challenge.

Some years ago a Frenchman, Fort—I think, is his name—operated at Bellevue Hospital on a number of cases with Dr. R. W. Taylor. I do not believe the results to have been satisfactory.

I would like to endorse the value of protargol. I think it is a most useful drug, especially when the injection of protargol has been preceded by dilatation by such an instrument as that of Oberländer or Kellman.

Dr. Blaine—It is a pleasure to hear from Dr. Munn, whether he agrees with you or disagrees. He is perfectly honest, and

I respect his honesty but doubt his conclusions. I will still maintain, until I am convinced in my own work that electrolysis does not destroy, that it *does* destroy. I am convinced of it. It is used on other mucous membranes and it is used on the skin surfaces. My patients get well by this method, after they have been treated two or three years by other physicians by other methods. They are satisfied and why should I not be.

In regard to Dr. Powers' remarks, he said just what I expected him to say. He lives by his knife, and consequently he uses his knife in treating strictures. My paper did not say much about strictures except that there were three methods of treating them. In some cases of stricture he is right, but when he says that electricity or galvanism or electrolysis will not destroy a stricture, he and I will have to differ. My patients with undoubted strictures get well under the use of galvanism, although in some cases of stricture I prefer to cut. But there are also cases in which I prefer the use of electricity, and, as I said in my paper, if there is any granular tissue back of the stricture, it will destroy that at the same time. You can not do that by cutting, and I do not think that Dr. Munn does it by the introduction of steel sounds. I have tried that method and failed, and I would reaffirm my allegiance to my method of treating this disease.

OUTLINE RECORDS OF FLEXION AND EXTENSION AFTER SERIOUS INJURY OF THE ELBOW JOINT.

BY GEORGE W. MIEL, M. D., DENVER.

Serious injury of the elbow joint forms one of the most trying injuries the surgeon deals with. Because the function of this articulation is necessarily the most varied, and correspondingly complex, even what might appear moderate injury without deformity may interfere for a long time with reëstablishment of comfortable and useful function. Simple fracture through the neck of the radius serves for illustration.

The elbow joint markedly resents a serious injury, and the considerable swelling resulting is slow to disappear. Meanwhile this high inflammatory action is attended with profuse plastic exudation into the joint and harmful organization by reason of its continuance. In no other articulation is this feature so marked, nor has it the same significance. Circumscribed hemorrhage, often present in some degree, adds to these considerations. Such injury indefinitely suspends the function of the joint, and normal restoration can not be expected notwithstanding exceptional apparently complete recoveries. However, improved methods and greater resource, the fruit of larger experience, enable us to anticipate good results more confidently than formerly; but what may be counted under the circumstances a good result is commonly a matter of difference between the surgeon and the patient and his friends.

In some instances nothing seems to stand in the way of restoration of function and everything progresses satisfactorily. In other instances, under almost as favorable circumstances, the institution of passive motion is opposed and resisted by the patient because of unwillingness to be put to discomfort in the matter, and proceeds with difficulty; especially is this the case if the subject of treatment is a claimant for damage. In still other instances, improvement looking to the restoration of function is slow and unsatisfactory under proper treatment wholly because of the condition of injury; under which circumstances an amiable and seemingly reasonable patient may become critical and dissatisfied. If he be an artisan, his long enforced illness excites comment from his friends and he becomes recipient of liberal advice, and learns of numerous others, who, with similar injury, recovered speedily. Should responsibility for the injury be placed upon a corporation, it is likely that by this time he has had legal advice.

Again, we have, in the instance of serious injury of the elbow joint, to deal with that individual whose restoration of useful function largely depends upon continuance of passive motion and use of the arm, in accordance with the direction of his surgeon after his professional services discontinue; but who neglects or disregards these instructions or inadequately applies

them, and retrogrades, but nevertheless holds the surgeon responsible. With a railway surgeon this may be a passenger who comparatively early leaves the care of this surgeon, perhaps to continue under the care of another at his destination, or perhaps because in his own estimation he counts himself sufficiently recovered to chance further improvement, with assurance that he will seek another surgeon in case of requirement.

Still again in the same category, and common to any surgeon, is that individual who discontinues the surgeon's services because he counts them no longer necessary, expensive, unsatisfactory, or because of displeasure, and does without further professional care or oversight, and yet holds the surgeon responsible for too limited function.

In cases presenting difficulties and concern for restoration of function the surgeon has a means of accurately ascertaining and indicating the progress of treatment, viz.: An outline record of flexion and extension; a tracing taken from time to time with date of each properly placed. This is effected by outlining the whole arm—hand omitted—against heavy pulpboard interposed between the arm and body. I use for the purpose a colored pencil—of good length for accuracy—and employ a different color upon each occasion for easy discrimination. The original tracing should outline the arm at its fullest attainable flexion and extension; in subsequent tracings, with the arm proper resting between the original outlines, the forearm alone need be outlined. To more clearly define it is my practice to record flexion on one side and extension upon the other. The patient's name is inscribed upon the board for identification.

In recording extension, the posture of the forearm midway between pronation and supination seems most proper; and in the same posture, in recording flexion, it comes most naturally into extreme flexion. The outline record offered in illustration represents a case of simple fracture through the neck of the left radius, function being restored at the proper time under the influence of passive motion.

In conclusion: After serious injury of the elbow joint, when restoration of function presents difficulties and occasions concern, an outline record as offered interests the patient, usually

encourages him, and perhaps satisfies him. If the markings show even the slightest progressive improvement, he will be amenable to a usually necessarily uncomfortable procedure of treatment —passive motion—required in some instances to be practiced for a prolonged period. For the surgeon it is a reliable guide, a satisfaction, and a record of scientific interest. It may be an evidence of competent services, as far as they go, should the patient retrograde after prematurely discontinuing these services. Finally, it is an evidence upon which to settle damage claims, and a check upon imposition in the settlement of such claims.

DISCUSSION.

Dr. John B. Roberts—I have been greatly interested for many years in injuries to the elbow joint. I think Dr. Miel has done us a great kindness in showing us his method of recording the results. The method is certainly a very valuable one. It shows us how we can make a clear, permanent record.

ON THE ESTABLISHMENT OF A CENTRAL LABORATORY OF PATHOLOGY IN DENVER.

BY CHARLES A. POWERS, M. D., DENVER.

The physicians engaged in the practice of medicine in the state of Colorado form an unusually intelligent and experienced body of practitioners. Among them are numbered very many who have won distinction elsewhere and whom exigencies of one sort or another have brought hither, while side by side with these stand many others who by diligence, sobriety, and study have forged their way to the front here in our own community. It is undoubtedly true that no state in our country can boast a higher standard in proportion to its medical population than can Colorado. This is not egotism; it is fact, and germane to the subject of this brief communication.

Our physicians and surgeons are clinicians rather than laboratory investigators. This is not so because of lack of aptitude

or desire, but because laboratory work demands something in the way of wealth on the part of the worker or endowment on the side of the laboratories themselves. Here and there may be found a plodding, self-sacrificing man who renounces world gain and devotes his life to scientific research; but these are few, and their work has to compete directly with that fostered by the large resources which are at the command of individual or institutional wealth.

On the clinical side of our professional work, then, we are well equipped. Can we say the same of the equally important laboratory branches? The physician and surgeon must go hand in hand with the pathologist and bacteriologist. Each is the complement of the other. Clinical facts are better construed in the light of the microscope and the test tube, while the pathologist may more intelligently interpret his findings when armed with the clinical history of the case. The necessity for thorough and extensive laboratory work can but be admitted. The accomplishment of this in a city the size of Denver is by no means easy of solution.

Such work in pathology and bacteriology as we have done here in Denver is performed by a few men who labor in a spirit of sacrifice and who "accommodate" other practitioners, mostly in a personal way. At times these men get modest monetary pay for this work; generally their only reward is the knowledge that they have added to the general good. Each of our two medical schools pays something to its teachers, but this pay is small and insufficient as a living in itself. (The bacteriologist to the city health department is not considered in this connection; I am told that he receives a definite salary for a definite amount of work.) In my own work I have felt the need of a trained pathologist of whom much in the way of extensive bacteriological and pathological work might be demanded. It is true that my friends who were able to do work of this nature have been very kind, and I make at this time grateful acknowledgment to the late Dr. H. C. Crouch and to Drs. Bergtold, Axtell, Fenn, Mitchell and others for the many favors which they have so willingly bestowed. But these have been real favors on their part. Their monetary recompense has been very small, and for this reason one has felt chary

in requesting as much work or as extensive research as he has at times felt that he would like. Take, for example, such a familiar tumor as that of a breast cancer. A simple examination as to the nature of the growth is easily made, but to examine the glands, skin, fat, and muscle at the incision edges takes more time than the surgeon feels that he can demand of others or employ himself.

It has been said that our clinical facilities are excellent. So should be our pathological resources. How may this be brought about? I can do no more than offer a suggestion, this to be amended and amplified as may seem best. A certain sum of money must be raised yearly. Let the medical schools of Denver put into a common fund the moneys which they now expend individually, adding, perhaps, to the present allotment. Something could be derived from the county hospital fund, and the intelligent board of county commissioners would doubtless increase the sum now allowed for the purpose if it were shown them how absolutely essential to the proper development of a large hospital is thorough work of this nature. Individual members of the profession would contribute, I feel sure, if they thereby felt certain of having their own work done, and I doubt not that yearly subscriptions could be obtained among the laity. With the money raised in these and other ways a suitable room could be obtained and placed in charge of a competent man, who should be selected from among our own workers or who might be commended to us by such a master as Welch or Councilman or Prudden. My friend, Dr. Freeman, to whom I broached this subject, made the sensible suggestion that the assistants might be selected from among the present workers in our two schools. The students from both of these schools might here be instructed in histology, pathology, and bacteriology. Such a laboratory would naturally receive the material from throughout this state, as well as from the adjoining states of Wyoming, New Mexico, Arizona, western Kansas, and Nebraska. Examinations for which the patients could be charged should be so charged, the sums thus collected to go into the common fund. The laboratory might care, as well, for the X-ray work. I doubt not that Messrs. Lacombe and Johnson, of the Mountain Electric Company, to whom our profession

owes so much, would be more than glad to see this, and to aid in establishing the X-ray machine and verifying its work from time to time. In this way careful records could be kept of the subjects—time of exposure, tube, plate, etc. This book of pictures and records could but show improved work as time went by. There is no reason why the work done under such circumstances should not be of the very best.

The foregoing embraces but brief suggestions as to what might be done, and some ways by which the end may be accomplished. I believe the plan to be a feasible one, and feel that at least a small beginning may be made. It is, in large part, a question of uniting our workers and raising a sufficient sum of money. I believe that this can be accomplished, and stand ready and willing to give material evidence of my convictions.

DISCUSSION.

Dr. W. P. Munn—Dr. Powers' paper has opened up the consideration of a subject which is of the utmost importance to every member of this society. It can hardly be overlooked that all of the operating surgeons and a very large majority of the clinicians of this city and the other cities of the state have been many times hampered in carrying on their scientific investigation of cases as they should be carried on and as we should like to see them carried on, because of the absence of facilities for complete pathologic and bacteriologic examinations. That certain imperfect efforts have been made to supply these deficiencies during the past few years does not entirely meet the needs of the situation at this time. The bacteriological diagnosis of one or two of the communicable diseases in no way meets the requirement of the surgeon, who desires to have a place where his tumors may be promptly, carefully, and reliably examined and reported upon. I believe there should be found among the membership of this society at least fifty persons who would be willing to contribute sums ranging from ten to twenty-five dollars a year to be used in the maintenance of such a pathologic laboratory as Dr. Powers has suggested, and I desire to add my name as one who would be a regular and willing contributor to the support of such a laboratory.

Dr. Edward Jackson—At the recent meeting of the American Medical Association at Columbus, a most striking feature was the exhibit made by the Indiana State Medical Society of the work of its pathological section. There were, I suppose, two or three hundred microscopic pathological specimens preserved and mounted, and quite a large number of photographs and microscopic specimens in addition. It made a fine exhibit. Their method of work as described to me is, when any member of the state society obtains a specimen, to immediately forward it to the committee that has the matter in charge, and they have it mounted and properly labeled, and sometimes photographed. Then at the ensuing meeting of the state society all the specimens that have been thus collected during the year, and some of the more remarkable or especially interesting specimens that have been in the museum previous years, are placed on exhibition. I can not conceive of anything that would add more to the interest of the meetings of this society than such an exhibit. Dr. Powers has certainly raised a very important question, and I hope it will be generally discussed and some definite action taken.

Dr. C. E. Edson—I want to add my word in approval and in commendation of Dr. Powers' paper. Its importance surgically has been emphasized. Its importance medically and clinically is equally great. I think it is greater than the clinician himself is aware of.

There are a great many problems in high altitude physiology as well as pathology which will bear investigation, points which can not be investigated without laboratory facilities. Now, few physicians, even if they are willing to devote their spare hours or their night hours to this work, have the facilities in their office or can equip the elaborate laboratory necessary to do this work well. Upon the establishment of such a pathological laboratory as Dr. Powers has suggested, it is a small extension of the primary work to have in connection with it such facilities for original research. I am sure the establishment of such a laboratory can be carried out by simply determining to do it, and we have an opportunity here to have one under the auspices of the state society, and carry on such work as the Indiana state society has done. I can only add my word to what Dr. Jackson said of the

extreme interest and suggestiveness of that exhibit. I trust most earnestly that the suggestion Dr. Powers has made be acted upon and we make some effort to have this kind of a laboratory.

Dr. E. J. A. Rogers—Such a laboratory is not only something that is to be desired, but something that is absolutely necessary. something that we can not do our work satisfactorily in either medicine or surgery without. Quite enough has been said already to impress the necessity for it. I should like to hear some man from outside of the city speak on it. They can perhaps get as much use out of it as we can.

Dr. J. R. Espey—As one of the outside members, I can say that I think it will be of as much use to us as to the residents of the city. We can not have the acquaintance with the individual pathologist that you would have here, but we could receive the benefits without the acquaintanceship; and I am sure the outsiders will be willing to contribute annually, as well as pay for the work that is done.

Dr. Powers—I feel there is very little in addition to be said. I know that this is a matter of importance to all of us. We have clinicians who are recognized as among the best in the country—many of them are considered authorities in various parts of our country; but we have not good and sufficient pathological resources. I think that the other men must have had the same experience which I have had. I have had my work done and it has always been done, but it has been a favor on the part of these men whom I have mentioned—Dr. Axtell, Dr. Fenn and Dr. Bergtold. A large share of our work, Mr. President, is gratuitous; a very large proportion of the work which each and all of us do is done without monetary remuneration. Now, we can do ordinary clinical work without monetary pay, for we thereby gain in experience and perhaps in other ways; but the pathologist to whom we send people has nothing to gain except the approval of his own conscience in doing good. The only way in which this can be remedied is by the establishment of some such laboratory as that suggested. It must be a small one at first, a single room, which ought to be primarily under the care of a very competent man who should devote his entire time. Such a man probably could be obtained at a modest salary; certainly for the first year

or two. I am sure that we can make a beginning, and after the beginning is made I am very certain that it will grow, and that the matter will progress from year to year.

VACCINATION.

BY R. K. HUTCHINGS, M. D., COLORADO SPRINGS.

It is taken for granted in this paper that the immortal Jenner was right. At present we have so improved in the method of vaccination that he very likely would scarcely recognize his own handiwork, but the underlying principle, as enunciated by him, has stood the test of time, and we can thank him for having had the courage of his convictions in introducing to the world one of the greatest blessings allotted to mankind.

The criterion of all remedies and principles, in general, is that gained by time and tested by numbers. Vaccination has stood this test in every particular. One fault we medical men have is in not insisting on revaccinations. We vaccinate a family once; perhaps it is ten, fifteen, or twenty years before these same people are vaccinated again. In the meantime some of them may have contracted smallpox from the fact that the time limit of the first inoculation has expired. In such a case the "anti-vaccinationist" gets in his deadly work, and proclaims abroad the idea that vaccination is a farce because here is a case with a scar and also a victim of the dread disease. More than likely one revaccination would have saved such a case from the disease.

If we could only have established a universal law that every person should be vaccinated every five years, scar or no scars, "nolens volens," it is safe to say we would in a very few years stamp out completely the scourge of smallpox. Cities in general would save money by bearing the expense of vaccinating all their inhabitants every five years, as the expense of one case of smallpox is more than hundreds of vaccinations.

The immunity obtained by vaccination lasts, as we all know, a variable time. In some it is only a few months, others a life-

time. Generally speaking this immunity is something less than ten years in the majority of cases, as is proved by the fact that we have an epidemic of smallpox approximately every ten years. During a smallpox scare every one is vaccinated, the disease is stamped out, and then no one is again vaccinated until another scare is abroad in the land. This interval of time is about ten years. Why not prevent the disease altogether by vaccinating everybody every five years and making sure of it? The physicians of the country have a moral duty to perform in educating their clients in these matters. Many of the laity think that to-day we practice the old "arm to arm" method of inoculation. The anti-vaccination societies promulgate this doctrine. These societies have become so strong that the government of England has been influenced to pass a law repealing the compulsory vaccination act and allowing any one who is "conscientiously opposed to vaccination" to file a certificate to that effect and remain unvaccinated. It is safe to prophesy that it is only a question of a short time until England will be visited with such an epidemic of smallpox that she will think the country has lapsed into the dark ages.

Much prejudice against vaccination is brought about by the method employed. The best results and the neatest and most typical scars are obtained by making *small* scarifications. The scarified place should be but little over one-sixteenth of an inch square. It should never be greater than one-eighth inch square. The scar is always larger than the original scarification, varying from one-quarter to many times greater, depending upon the manner in which it is done and the patient operated upon. Some cases show ugly sores, slow to heal and aggravating in every particular, due to a low condition of vitality of their tissues. These cases are the exception, and are not to be considered in the general results obtained.

A great mistake is made if the patient is allowed to dress the vaccination with vaseline or any ointment. The best results are obtained by keeping the sore perfectly dry from start to finish. The simplest and quickest method for protecting the scarified surface is to put a small pledget of absorbent cotton upon the place after the lymph is dry and over this an adhesive

strap. As soon as the arm begins to get sore the cotton is removed and a fresh piece strapped on. This insures perfect protection. It is needless to say that surgical cleanliness is to be practiced at all times. Antiseptics, if used to cleanse the arm, must be rigidly removed before applying the lymph so as not to kill the vital principles of the virus. This small item is often forgotten, and the consequence is no scar is obtained.

Occasionally a lump forms at the site of inoculation. This lump is spongy, about the size of a pea and red, covered at times by a small scab. It generally remains a week or ten days—perhaps longer, and then drys up, leaving no scar. Many pronounce such cases successful. This is not true, and the patient is not immune. Any vaccination to be successful must leave a scar. In many instances a second vaccination of such cases obtains a successful result, proving the first time a failure. I have never been able to ascertain the reason of this lump formation, and have never found any mention of it in any records consulted.

Two places of inoculation at the same time are better than one, as will be shown below. These two scarifications, made as stated above and about two inches apart, do not make as sore an arm as one large scarification. It has been proved that two or more scars give greater immunity, for the regulation time, than one. The immunity obtained from two scars is greater for the time being, but does not last any longer than if only one scar was present. I have seen one arm with six scars, all made at the same time, the physician being under the impression that he was giving the child immunity for life. This same child, aged about nine years, was vaccinated in two places and both places gave typical scars.

Smallpox itself does not give immunity to itself, as is proved by many cases on record of people having it twice and even three times. Vaccination will often "take" in a person who has had smallpox.

If by some mischance, either individual or operative, a foul sore is the result of a vaccination, the only thing to do is to treat it as any other wound is treated. Cleanse it thoroughly and frequently with antiseptics and then use some of the antiseptic powders, aristol preferred. After a vaccination has once de-

generated into a regular ulcer, it is to be treated as such and not as a vaccination any more.

The following article by Dr. J. Frank McConnell, health officer for Dona Ana county, Las Cruces, N. M., read before the El Paso County Medical Association at El Paso, Texas, is quoted as being of great scientific interest. It is entitled "A Few Clinical Observations During an Epidemic of Variola:"

"During a recent epidemic of smallpox in this county, I was able to watch very closely this disease, which privilege is not allowed to the larger number of practitioners. The disease was confined wholly to the Mexican population—who as a rule are unprotected by vaccination—and made the greatest ravages among children under ten years. In some cases vaccination had been performed during early life; and in others more recently, and in the large majority of instances, never.

Several extraordinarily severe cases coming under my care, in whom vaccination had been successful, I was curious to note the outcome.

Sophia G., aged 15 years, was successfully vaccinated at an early age, scar being quite distinct and typical, and again six weeks previous to her illness. She was taken ill with smallpox, showing all the ordinary symptoms, except as regards pain in her back, which was more severe than usual. The attack appeared to be a mild one, and a good prognosis was made on first appearance of the eruption, which was discrete in character. The temperature, however, continued high, with laryngeal involvement, subsequent examination revealing fibrinous exudate and edema. Death followed on the ninth day, the pustules being fully developed. Three other children in the same family who had most typical vaccinations became infected. All had severe attacks, two recovering. Four other cases in different families were taken with the disease; all had been vaccinated six weeks prior to the attack, and in all cases the disease ran its course, showing nothing of the "varioloid" type, but with all the symptoms of moderately severe discrete variola. Recovery occurred in each case.

In this connection I would like to say that it is my opinion that the vaccine matter as supplied to physicians is at fault—

the virus being more or less attenuated in its potential elements, if such an expression is admissible, and for this reason such a degree of protection is not established as to ward off infection. I would also draw attention to the fact that this epidemic illustrated very clearly to me the old axiom, "The more scars, the less liability to smallpox," no person having more than two scars becoming infected. I would, therefore, earnestly advocate that the old practice of inoculation in two or three places be adhered to, rather than the single scarification now in vogue.

A peculiar phase of the epidemic was the almost constant complication of catarrhal or purulent conjunctivitis, and the appearance in such cases of the initial macular or measly-form rash.

Regarding the term "varioloid," which we accept as meaning a modified smallpox in persons previously vaccinated, the following may be of interest: Among the Mexicans a mild form of smallpox exists during an epidemic, which they call "Viruela blanca," or white smallpox. This condition seems to me to be closely allied to the so-called varioloid, setting in with abruptness and severity, and continuing more mildly, with few papules and no secondary fever. I have seen many such cases, but the curious feature is—*there is no history of vaccination.*

A few words as to treatment. I should like to make known the satisfactory therapeutic power of tartrated antimony, commonly known as tartar emetic, in this disease. Thirty-three cases in which this remedy was used showed results which were highly gratifying; in no case did the secondary fever last more than two days, and in no case was it so severe as in those cases where the drug was not exhibited. A valuable feature, also, was the complete absence of pruritus, without local treatment, and the general return of the skin to its pristine normal condition, with little or no pitting. A case will illustrate: Two Mexican children, aged 7 and 9 respectively, in one family, were treated. To the youngest I administered tartar emetic throughout the disease, to the elder I gave routine expectant treatment, merely meeting the indications as they arose. The secondary fever and delirium in the latter was most intense, the skin irri-

tation was so great the hands had to be padded. The youngest child, while presenting all the skin eruptions, seemed to be little affected by the toxic properties of the disease; the contrast was so great between the two cases that even the mother noted the results from the different treatment, and begged me, with religious fervor characteristic of the race, to give the little white powders to the elder child. I felt guilty for my experimentation, and commenced administration of the tartrate—with little amelioration of symptoms, however. Both cases made good recoveries.

I observed in this latter case, as in others, that the remedy must be given early in the disease in order to obtain its full therapeutic effect.

The dose exhibited varied from 1/250 to 1/16 grain, given at intervals of two to four hours, according to age and the severity of the symptoms. I found that smaller doses were more efficient, that is to say, 1/100 grain was more satisfactory than 1/16 grain, and it was the former dose that I gave almost exclusively after my first dozen cases of experimentation. The larger doses frequently exaggerated the symptoms, and in one case where they were persisted in a crop of furunculi called attention to the presence of its physiologic effects.

I therefore believe we have in this drug a very valuable agent in the treatment of smallpox, and I hope to have my experience verified in the practice of others. I have written these few observations in the hope that they may be of service in the treatment, both prophylactic and active, of this much dreaded disease."

It is only a question of a short time until the quill or ivory point will be a relic of the past. The most scientific method is the use of the hermetically sealed capillary tubes. In comparing two hundred cases of point vaccination and two hundred cases of tube vaccination, I find the best results accrued from the tubes. The local reaction was not so great, the healing of the sores was quicker, and the scars were small and typical. Among one thousand cases in round numbers, both of point and tube vaccinations operated upon the past year, there were no serious results. I have used all the different vaccine viruses

manufactured, and adopted Parke, Davis & Co.'s as the standard, because of its reliability and the ease with which it can be used.

If every country to-day would but follow the example set by Germany, our civilized peoples would very soon never have to pay any more money for pest houses or smallpox nurses. The following article, by Dr. Bizzozzero, of Rome, published in the Philadelphia Medical Journal, gives the whole thing in a nut shell:

"Germany stands alone in fulfilling in a great measure the demands of hygiene, having in consequence of the calamitous smallpox epidemic of 1870-'71 enacted the law of 1874 which makes vaccination obligatory in the first year of life, and revaccination also obligatory at the tenth year. What was the result? With a population of 50,000,000, having in 1871 lost 143,000 lives by smallpox, she found by her law of 1874 the mortality diminished so rapidly that to-day the disease numbers only 116 victims a year. These cases, moreover, occur almost exclusively in towns on her frontier. If it were true, continued Prof. Bizzozzero, that a good vaccination does not protect from smallpox, we ought to find in smallpox epidemics that the disease diffuses itself in the well vaccinated no less than in the non-vaccinated countries. But it is not so. In 1870-'71, during the Franco-German war, the two peoples interpenetrated each other, the German having its civil population vaccinated optionally, but its army completely revaccinated, while the French (population and army alike) were vaccinated perfunctorily. Both were attacked by smallpox; but the French army numbered 23,000 deaths by it, while the German army only had 278; and in the same tent, breathing the same air, the French wounded were heavily visited by the disease, while the German wounded, having been revaccinated, had not a single case."

It behooves the medical profession as a body to take concerted action and make a fight to a finish upon ignorance and prejudice as exemplified by the "Anti-vaccination Societies." It is a crying shame that a thoroughly preventable disease is allowed to exist in this enlightened age, simply because we are too careless and indifferent to make a stand and have laws passed for the protection of the citizens at large.

ANENT AN URGENT DUTY OF THE PROFESSION.

BY B. OETTINGER, M. D., DENVER.

While the medical bill for which executive assent was recently withheld ostensibly failed to become a law because it lacked this official approval, that which really decided its fate, and, of equal importance, the difficulty that would have been encountered in its enforcement in case the bill had become a state law, may be attributed to superficial judgment born of a widespread dearth of knowledge; and more particularly to a considerable public opinion into which there enters no intelligent conception of the laws of health and disease, as well as to a cast of mind common to many persons in our communities who know no more of the facts proven by the science of biology than perhaps the name given to its successive developmental phases, and which even in such a case is tersely supposed to mean that "man is descended from the monkey."

To-day, as in all times past, in the wake of that method of investigation which ignores exact objective research and wholly relies upon interrogating self-consciousness, there necessarily follows a philosophy based upon facile imagination and ofttimes much empty pride. Such a system adopts the metaphysical idea that since man stands for a separate and distinct work in the creation, bearing dominion over all other life-forms on account of a pristine innate superiority, and is, in short, as has been said, "the measure of the universe," the study of his being can have nothing in common with that of living things, lower in the scale of life, but must needs be solely directed towards ferreting man's resemblance to an indulgent First Cause, who, by according him so exalted an earthly place, has thus evidenced an exceeding preference. With due appreciation of a principle that has been the inspiration of much exalted human effort, we nevertheless may not shut our eyes to the fact that, whatever the progress in the study of the relation of man to his Creator from Aristotle's time to our own, such advance attained as the result of *purely subjective* modes of investigation has not materially influenced

man's life-experience or his conceptions concerning it. On the other hand, in reference to the latter, scientific research, consequent to the development theory of Darwin, presented evidence which proved man's relation to lower life-forms and environment; and thus it happens that all that stands for the best of modern psychology, where not based upon, at least pursues its investigations within lines which are compatible with established structural and physiological data—and this despite the fact that even in our day we may note the efforts of ill-trained minds of metaphysical trend who talk in beautifully rounded circles, and much, of the sole existence of spirit and mind, and yet are content to dismiss the theory of evolution with twenty words.

The physician of to-day needs be interested in these conditions as a representative of a special branch of science whose teachings are in strict accord with the truths of evolution; moreover, because he may daily note that adherence to the belief in the miraculous of which some pretenders cunningly make use by publishing in the name of medical science, and with occasional coarseness of diction that violates public decency, untruths meant to intimidate, while yet others attract their followers by the exploitation of some one principle of therapy, elaborated into a system which is guaranteed to cure all disease; and, lastly, his interest is demanded because he must remark the rapid growth of a sect whose founder, entertaining theories which have much in common with some systems of idealism and principles propounded by mystic schools, has adapted them, in general, to the history of that religious revolution whose eventual outcome was Christianity, in particular, to the cure of disease, and, by announcing these principles as new, relies upon the superficial education and the active imagination of her followers to do the rest.

No one of us but claims that the modern physician more than fulfills the place of a mere dispenser of drugs, and that the surgeon uses the knife upon other grounds than did the mediaeval barber. By the same token, aside from his particular office to advance ideas and evolve sound plans to promote the status of public health and by his knowledge to contribute to the usefulness and well being of the individual, the physician must assist

in holding aloft, for its own sake, the banner of truth in the march of human progress. I am well aware that in pursuing such an ideal he is met with prejudice and superstitious credulity among classes of men and women who, perhaps successful within the narrow limits of their endeavors, are often erroneously regarded as representative; or by persons that in the process of devouring much print, in which is included the wonderful medical novel as well as the pseudo-scientific and psychologic, become permeated with fashionable fads upon which is based much complacent erudition. Another class, considerably less dangerous however, who passively oppose scientific progress, are the truly illiterate, who swallow whole the self-announced deeds of the wonder-workers, be they the delusions of a sect, or the knowing frauds of advertising fakirs alleged for pure gain.

I am no less aware that these facts are tacitly recognized by the profession, and that, conscious of its duties within its accepted domain, it has rightly been averse to place itself upon a level with many of its decriers. If we have been unwilling to discuss facts which are daily being disclosed by the study of pathology with individuals who, from one point of view or another, oppose its tenets, assuredly it has been because such discussion could scarcely be intelligent or intelligible if one's opponent be entirely without knowledge of his subject. One does not require skilled labor, nor ask an opinion concerning it, of the unskilled. If the world recognizes any value whatever in human knowledge and the pursuit of it, it must manifestly be impossible to class the work of the advertising quack, or the efforts of the clod of yesterday but the healer of to-day, with the applied knowledge of the educated physician. This is, in fact, the point to be made in taking our stand for the profession—be it in delineating the position of modern medicine and surgery in general, or in stating our case for legislation beneficial to the public health, or in making a plea for the advancement of the latter and for views of fair and balanced minds upon lines that will be suggested by this paper. I think this reasonable argument has not been sufficiently urged in the past. Of equal importance is the fact that many erroneous views are countenanced by the public because the energies of medical men, while zealously applied within the limits

of their accepted sphere, nevertheless fail to keep the profession in sufficient touch with the growth and direction of public opinion concerning medical science. The fact that certain persons who are unable to competently judge of the merits and demerits of the present status of the latter, or others who are actuated solely by mercenary motives, by diverse methods do attempt to gain the good will of the public at large is doubtless the main reason that legitimate physicians refrain from so doing. Yet it must be deemed a grave error to thus build a Chinese wall about ourselves, and to neglect to employ reputable means at our command to enlighten the people as to views held by educated physicians and the reasons therefor. Were this done there would be fewer anti-vivisectionists, fewer persons possessed of considerable information concerning many other matters who stand pat with the oft-heard cant statement, "All medicine is an experiment."

How may we reach the public? We may in a measure be guided by the charlatans and the religious enthusiasts, for they have studied well the methods that may be best employed. The former advertise in the daily papers. I found that upon Sunday, May 1, 1899, a date selected at random, a fraction over 28 per cent. of the total amount of advertising that appeared in one of our leading morning dailies was paid for by medical quacks, clairvoyants, and others of that ilk. Shall we advertise in the daily papers? Certainly not; but a representative medical body might, as it sees fit, employ their columns to legitimately disseminate truths established by scientific research. That religious sect of mushroom growth that purports to heal the sick by denying the existence of disease makes proselytes by aid of free lectures, delivered throughout the country by special representatives. Through the same media, with demonstration of facts and an appeal to reason instead of the imagination, it behooves us to educate the people in the matter of a reasonable discrimination of cases.

Our first need relates to a proper organization of the medical profession of the state, by counties or in any other systematic way, whose object shall be the widespread promulgation of some essential scientific data. Beginning as have all movements which

have ultimately been successful, let there be small meetings where, in the light of patent fraud or the physiological basis upon which they rest, let there be explained the fallacy of modern miracles. Let there be free distribution from the office of the association of pamphlets explaining specific cases. Let the searchlight of common sense be thrown upon that therapeutic marvel relating to special principles of massage which its disciples teach was revealed by cadaverous study upon the plains of the noble red man and his victims, and whose claims for recognition are presented by quite the most picturesque balderdash of any quack body. Again, let the dogma that "there is no life, truth, intelligence, or substance in matter" be applied to the relation of man's senses to his every environment, and thus, by an absolute and universal denial of their evidence, permit the principle to lead, as it logically must, to the propounding of insane delusions as no evidence of an abnormal mind.

As a means employed by many influential and representative societies, let this body of physicians publish an attractive sheet devoted to the interests of modern medical science in its relation to the public at large.

The cost of placing such an organization upon a working basis would not require a large sum of money, since it would almost entirely be confined to the expense of placing its utterances before the people. Volunteers would not be lacking when the need of concerted action on the part of the profession, upon lines at least approximating those which have been designated, were once clearly comprehended. Modern medicine's proper status can never be attained by legislation alone; since enforcement of the latter needs be supported by an intelligent and appreciative public opinion, a factor which, under existing conditions, will scarcely be created by efforts that will emanate from any other source than our own ranks.

These suggestions may appear radical, but I plead in justification therefor a firm conviction that the medical profession of to-day has a clear and pressing duty aside from its accepted field of labor. May it be generally recognized and ultimately performed with the well directed zeal born of active and most hearty coöperation.

LIST OF MEMBERS.

Date.		
1898	Allen, J. Q.	Montrose
1894	Ambrook, Mary L.	Boulder
1896	Ames, Fred N. S.	Denver
1873	Anderson, B. P.	Colorado Springs
1886	Arbogast, B. A.	Breckenridge
1892	Ashbaugh, A.	Central City
1896	Ashley, Wm. W.	Ouray
1892	Axtell, E. R.	Denver
1894	Bagot, W. S.	Denver
1898	Baird, W. J.	Denver
1898	Baker, J. A.	Florence
1892	Baker, Madeline Marquette	Denver
1897	Ballin, M.	Leadville
1892	Bane, W. C.	Denver
1895	Beatty, J. T.	Highlands
1897	Beggs, Wm. N.	Denver
1892	Bellrose, Norman W.	Eaton
1898	Bennett, A. L.	Denver
1897	Bergtold, W. H.	Denver
1878	Beshoar, M.	Trinidad
1894	Black, J. A.	Pueblo
1892	Black, G. Melville	Denver
1895	Blaine, J. M.	Denver
1879	Blickensderfer, J. C.	Denver
1888	Boice, Jno.	Denver
1896	Bonesteel, Arthur E.	Central City
1888	Bonnet, W. M.	Denver
1892	Bonney, S. G.	Denver
1894	Boyd, E. T.	Leadville
1895	Brasher, Lewis B.	Denver
1895	Brown, Elizabeth E.	Denver
1895	Buchtel, W. H.	Denver

Date.		
1894	Bulette, W. W.	Pueblo
1896	Bull, F. B.	Kiowa
1894	Bull, H. R.	Grand Junction
1896	Burleigh, Geo. W.	Boulder
1894	Burns, T. M.	Denver
1896	Burns, Horace R.	Leadville
1899	Burroughs, J. A.	Ashville, N. C.
1895	Calhoun, A. W.	Denver
1897	Call, Chas. H.	Greeley
1892	Campbell, W. A.	Colorado Springs
1883	Carlin, P. V.	Denver
1895	Carlin, T. J.	Denver
1895	Carrier, F. N.	Cañon City
1898	Carver, W. B.	Denver
1898	Chapman, W. S.	Rouse
1897	Chenoweth, M. S.	Elbert
1894	Chipman, J. C.	Sterling
1883	Clark, J. K.	Denver
1889	Clark, J. L.	Denver
1898	Clark, L. G.	Glenwood Springs
1897	Cline, J. W.	Georgetown
1894	Cochems, F. N.	Salida
1899	Coffman, F. R.	Minturn
1898	Coleman, J. F.	Montrose
1899	Coman, L. Z.	Boulder
1898	Condon, J. F.	Breckenridge
1894	Conroy, C. P.	Denver
1890	Coover, D. H.	Denver
1882	Corwin, R. W.	Pueblo
1897	Cox, J. E.	Hooper
1883	Craig, W. B.	Denver
1878	Craven, T. H.	Cañon City
1894	Davis, W. B.	Pueblo
1892	Davis, W. C.	Denver
1895	Davis, W. H.	Denver
1899	Dayton, D. F.	Trinidad
1894	Dean, M. H.	Glenwood Springs
1892	Debeque, W. A. E.	Debeque
1874	Denison, Chas.	Denver
1899	Denney, R. H.	Elbert
1895	Delehanty, Edw.	Denver
1887	Dorland, W. L.	Pueblo

Date.		
1898	Dow, W.	La Junta
1894	Durbin, L. T.	Denver
1897	Edson, Carroll E.	Denver
1891	Elliott, Jno. F.	Idaho Springs
1899	Elliott, H. R.	Denver
1871	Elsner, Jno.	Denver
1885	Eskridge, J. T.	Denver
1897	Espey, Jno. R.	Trinidad
1890	Exline, J. W.	Denver
1899	Farnsworth, J. A.	Fort Morgan
1897	Fenn, W. B.	Denver
1894	Ferguson, C. J.	Denver
1895	Fierstone, J. L.	Fort Morgan
1888	Finney, Frank	La Junta
1897	Fischer, P. W.	Walden
1882	Fisk, S. A.	Denver
1891	Fleming, C. K.	Denver
1885	Forhan, T. J	Rouse
1891	Foster, Jno. M.	Denver
1895	Freeman, Leonard	Denver
1896	Freeman, Russell B.	Denver
1898	Friend, F. M.	Lamar
1898	Gale, J. A.	Denver
1897	Gallaher, T. J	Denver
1885	Galloway, B. S.	Leadville
1888	Gardiner, C. F.	Colorado Springs
1897	Garnett, A. H.	Colorado Springs
1894	Gilbert, Bartlett	Denver
1893	Gildea, P. F.	Colorado Springs
1896	Gould, John	Grand Junction
1898	Graham, C. A.	Denver
1879	Graham, J. W.	Denver
1885	Graham, R. F.	Greeley
1890	Grant, W. W.	Denver
1898	Grass, J.	Trinidad
1898	Greedy, F. A.	Denver
1880	Greene, J. L.	Minturn
1896	Griffith, Benj. F.	Leadville
1897	Guthrie, E. C.	Aspen
1884	Hall, J. N.	Denver
1896	Hamilton, Geo.	La Jara
1898	Hamly, L. B.	Salida

Date.		
1888	Harrison, M.	Boulder
1889	Hart, James A.	Colorado Springs
1894	Harvey, H. G.	Denver
1892	Haskins, B. F.	La Junta
1885	Hassenplug, G. K.	Denver
1898	Hasty, J. G.	Lamar
1879	Hawes, Jesse	Greeley
1892	Hawk, J. W.	Green River, Wyo.
1880	Hawkins, T. H.	Denver
1896	Hazlett, H. F.	Pueblo
1895	Heath, Lillian	Rawlins, Wyo.
1897	Heimberger, D.	Leadville
1893	Hershey, E. P.	Denver
1894	Hickey, C. G.	Denver
1893	Higgins, J. W.	Denver
1895	Hill, E. C.	Denver
1899	Hillkowitz, P.	Denver
1898	Hoffman, D. S.	Lake City
1892	Holmes, A. M.	Denver
1898	Holmes, W. E.	Gunnison
1894	Hopkins, S. D.	Denver
1875	Horn, T. G.	Colorado Springs
1898	Hotopp, Theo.	New Castle
1894	Howard, E.	Denver
1884	Howland, H. H.	Denver
1897	Hubbell, S. J.	Fort Lupton
1886	Hughes, T. A.	Denver
1897	Hunter, A.	San Luis
1897	Hutchings, R. K.	Colorado Springs
1892	Hutchinson, J. Cooper	Florissant
1898	Ingersoll, L. F.	Grand Junction
1895	Jackson, Edw'd	Denver
1898	Jackson, F. A.	Salida
1896	Jacobs, S. Wesley	Denver
1895	Jaeger, Chas.	Denver
1898	James, F. E.	Estes Park
1898	Jay, M.	Gunnison
1884	Jayne, W. A.	Denver
1896	Jeannotte, J. A.	Leadville
1895	Jefferson, B. L.	Hayden
1895	Jeffery, Alicia F.	Denver
1894	Johnson, Abijah	Montrose

Date.		
1897	Johnson, Dryden	Antonito
1898	Johnson, H. R.	Denver
1895	Johnson, J. E.	Denver
1899	Kahn, Maurice	Leadville
1891	Kahn, Sol G.	Leadville
1896	Kearby, E. W.	Rocky Ford
1893	Keith, John G.	Leadville
1884	Kelly, J. P.	Golden
1896	Kemble, L. H.	Denver
1896	Kickland, W. A.	Fort Collins
1890	King, A. T.	Pueblo
1897	Kinney, J. E.	Denver
1892	Kleiner, M.	Denver
1895	Lake, E. F.	Denver
1891	Law, G.	Greeley
1896	Law, John	Leadville
1889	Leavitt, B. C.	Denver
1882	Lee, E. A.	Fort Collins
1874	Lemen, H. A.	Denver
1873	Lemen, L. E.	Denver
1892	Le Mond, R. F.	Denver
1887	Levy, Robert	Denver
1891	Liebhardt, Laura L.	Denver
1895	Liggett, Wilbur T.	Cripple Creek
1898	Liggitt, R. D.	Mosca
1896	Little, W. T.	Cañon City
1898	Littrell, R. S.	Rye
1896	Lobingier, Kate R.	Denver
1898	Lockard, W. G.	New Castle
1896	Lof, A. J. O.	Aspen
1896	Love, Minnie C. T.	Denver
1890	Lucy, Daniel R.	Denver
1888	Lyman, C. B.	Denver
1894	Mack, M. H.	Denver
1898	Mackintosh, N.	Gunnison
1898	Macalester, R. K.	Glenwood Springs
1896	Maclean, A. M.	Leadville
1896	Macomber, G. N.	Denver
1898	Mafan, T.	Salida
1897	Maffett, L. O.	Colorado Springs
1895	Maghee, Thomas	Rawlins, Wyo.
1896	Mann, Alfred	Denver

Date.		
1894	Marks, A. D.	Fort Lupton
1893	Melvin, J. Tracy	Saguache
1895	Meuer, S. H.	Denver
1892	Miel, Geo. W.	Denver
1897	Mitchell, Wm. C.	Denver
1897	Moore, Alice T.	Denver
1894	Moulton, G. H.	Glenwood Springs
1896	Mugrage, S. G.	Denver
1894	Muir, Hannah T.	Colorado Springs
1891	Munn, W. P.	Denver
1898	MacAlister, S.	Rocky Ford
1895	McArthur, A. D.	Littleton
1871	McClelland, W. F.	Denver
1896	McCreery, R. L.	Colorado Springs
1895	McDaniel, J. W.	Villa Grove
1894	McDermith, S. T.	Denver
1894	McDonald, A. J.	Leadville
1894	McDonald, W. J.	Rocky Ford
1897	McDowell, U. D.	University Park
1899	McFadden, J. G.	Loveland
1892	McHugh, P. J.	Fort Collins
1898	McKelvy, W.	Breckenridge
1895	McKenzie, George	Victor
1884	McLauthlin, H. W.	Denver
1896	McLean, Donald A.	Fort Collins
1891	McNaught, F. H.	Denver
1896	McNeelan, M.	Basalt
1894	Nelson, C. D.	Greeley
1895	Neuman, Daniel	Denver
1896	Nichols, Chas. B.	Fort Wingate, N. M.
1882	O'Connor, J. W.	Denver
1899	Oettinger, B.	Denver
1899	Orr, C. S.	Alamosa
1898	Otis, W. D.	Fort Morgan
1890	Packard, Geo. B.	Denver
1898	Packard, W. A.	Monte Vista
1885	Parkhill, Clayton	Denver
1895	Peavey, Josephine L.	Colorado Springs
1896	Pedersen, P. Hyrup	Laramie, Wyo.
1895	Pennock, V. R.	Longmont
1887	Perkins, I. B.	Denver
1894	Perkins, J. M.	Denver

Date.		
1890	Pershing, H. T.	Denver
1885	Pfeiffer, O. J.	Denver
1882	Phillips, G. W.	La Junta
1898	Porter, F. R.	New Windsor
1898	Prewitt, F. E.	Silverton
1895	Powers, Chas. A.	Denver
1893	Powers, J. J.	Denver
1895	Purcell, J. W.	Denver
1897	Reed, W. W.	Fowler
1882	Rivers, E. C.	Denver
1896	Roberts, Una G	Denver
1887	Robinson, A. J.	Aspen
1898	Robinson, A. L.	Glenwood Springs
1889	Robinson, J. R.	Colorado Springs
1898	Robison, M. A.	Victor
1898	Roehrig, G. F.	Denver
1883	Rogers, E. J. A.	Denver
1898	Rogers, F. E.	Littleton
1884	Rothwell, E. J.	Denver
1884	Rothwell, P. D.	Denver
1889	Rothwell, Wm. J.	Denver
1897	Rothwell, Wm. J	Hugo
1896	Rover, H. W.	Denver
1897	Rowan, W. W.	Ouray
1899	Rucker, P. T.	Basalt
1895	Sawins, A. H.	Denver
1893	Seebass, Alfred R.	Denver
1891	Sewall, Henry	Denver
1892	Sheets, E. A.	Denver
1895	Shippey, O. R.	Villa Grove
1887	Shollenberger, C. F.	Denver
1895	Shotwell, W. E.	Denver
1895	Sigman, H. G.	Cripple Creek
1896	Simon, Saling	Denver
1897	Singer, W. F.	Pueblo
1898	Smith, F. M.	Holyoke
1898	Smith, J. Sol.	Denver
1898	Smith, W. W.	Erie
1892	Snitcher, H. C.	Denver
1875	Solly, S. E.	Colorado Springs
1896	Spivak, C. D.	Denver
1895	Spratlin, P. E.	Denver

Date.		
1896	Steeves, C. P.	Littleton
1871	Stedman, A.	Denver
1898	Stephenson, W. C.	Florence
1899	Stevens, E. W.	Denver
1895	Stiver, Thomas J.	Denver
1895	Stockett, B. F.	Denver
1894	Stover, George H.	Denver
1879	Strickler, W. M.	Colorado Springs
1892	Stuver, E.	Fort Collins
1898	Sumner, C. O.	Fairplay
1896	Taussig, Arnold S.	Denver
1891	Taylor, Hugh L.	Denver
1889	Taylor, T. E.	Denver
1897	Thomas, J. N.	Denver
1878	Thombs, P. R.	Pueblo
1894	Thompson, David	Denver
1896	Thorp, R. L.	Denver
1896	Thorp, Chas. W.	North Platte, Neb.
1898	Thrailkill, G. H.	Central
1898	Trovillion, E. B.	Gold Hill
1892	Tucker, Beverly	Colorado Springs
1897	Tyler, G. E.	Denver
1892	Van Meter, S. D.	Denver
1899	Van Zant, C. B.	Denver
1891	Vroom, J. N.	Denver
1899	Warren, H. E.	Denver
1893	Waxham, F. E.	Denver
1896	Wetherill, H. G.	Denver
1894	Wheeler, E. A.	Denver
1873	Whitehead, W. R.	Denver
1895	Whiting, J. A.	Cripple Creek
1888	Whitney, H. B.	Denver
1896	Wiest, Sard	Longmont
1894	Willard, J. J.	Pueblo
1899	Williams, A. H.	Denver
1898	Williams, C. W.	Manzanola
1895	Williams, T. J.	Leadville
1874	Wilson, W. E.	Denver
1885	Wood, L. H.	Denver
1889	Work, Hubert	Pueblo
1887	Worthington, A. K.	Denver
1897	Zederbaum, Adolph	Denver

HONORARY MEMBERS.

Date.		
1880	*O. D. Cass, M. D.	
1873	*Hon. John Evans, M. D.	Denver
1889	Thos. F. Rambold, M. D.	St. Louis, Mo.
1879	D. H. Dougan, M. D.	Denver
1895	Prof. John Ridlon	Chicago, Ill.
1895	Prof. Frank Norbury	St. Louis, Mo.
1895	Prof. Victor C. Vaughan	Ann Arbor, Mich.
1899	Robert H. Babcock, M. D.	Chicago, Ill.
1899	John B. Roberts, M. D.	Philadelphia, Pa.

* Deceased.

Total active membership.....326

DECEASED MEMBERS.

NAME.	Year Elected	Age	Residence at Death.	Date of Death.	MEDICAL COLLEGE.	Year Grad.
Lionberger, D. B.	1872	....	Denver	1873	.....	.....
Davis, S. B.	1873	....	Central City	1875	{ Rush Medical College { University Medical College, N. Y.	1865 1866
Johnson, G. L.	1874	....	Denver	1875	Medical Department Iowa University	1872
LeCarpentier, Jules	1875	....	Fairplay	1876	University Paris	1865
Davis, M. J.	1872	....	Golden	1876	.....	.....
Thacker, W. H.	1871	....	Denver	1876	Medical Department, University Michigan	1862
Boone, S. H.	1873	....	Denver	1877	University Louisville, Ky	1857
Lansingh, K. V. R.	1876	....	Denver	1879	Albany Medical College	1870
Dickinson, J. S.	1871	....	Denver	1879	Royal College Surgeons, England	.....
Taylor, R. T.	1873	....	Leadville	1882	.....	.....
Gambell, F. W.	1881	....	Leadville	1882	Detroit Medical College	1873
Warn, W. H.	1879	....	Denver	1882	College Physicians and Surgeons, N. Y.	.....
Wilson, M. A.	1880	....	Denver	1882	Ohio Medical College	1866
Craven, J. S.	1880	....	Pueblo	1884	Iowa State University, Medical Department	1867
Griffith, D. S.	1882	....	Durango	1886	Jefferson Medical College	1863
MacLean, A. M.	1881	....	Leadville	1886	{ Medical Dept. University of Michigan { University of Nashville, Medical Dept.	1874 1863
Mavity, W. K.	1884	....	Denver	1886	Jefferson Medical College	1865
McMurtrie, G. S.	1873	61	Denver	August, 1887	University Pennsylvania, Medical Dept.	1860
Buckingham, R. G.	1871	73	Denver	March 18, 1889	Berkshire Medical College	1836
Lathrop, Charles C.	1877	36	Denver	May 28, 1889	Bellevue Hospital Medical College	1875
Fay, William M.	1883	33	Denver	January 13, 1889	Kansas City Medical College	1881
Brumond, P. B.	1884	....	Idaho Springs	September, 13, 1889	Chicago Medical College	1869
Grimes, W. S.	1883	....	Denver	December 21, 1889	Miami Medical College	1857
James, H. C.	1881	50	Ouray	January 4, 1890	Jefferson Medical College	1870
Wooster, David	1888	87	Idaho Springs	April 8, 1891	Medical Department, University of Cal.	1885

Keables, E. H.	1888	71	Alma	January 6, 1892	Bellevue Hospital Medical College	1861
Cory, J. B.	1883	54	Denver	January 24, 1892	Medical Department University of Michigan	1862
Worthington, R. H.	1884	46	Denver	May 13, 1892	Medical Department University of Denver	1884
Parker, C. M.	1873	54	Denver	August 12, 1892	University of Louisiana / Medical College of Virginia	1859 / 1862
Wicks, E G.	1889	34	Denver	August 26, 1892	Medical Department University of Maryland	1888
Davis, J. C.	1880	66	Zurich, Switz.	October 8, 1892	Castleton Medical College	1847
Steele, H. K.	1871	68	Denver	January 20, 1892	University City of New York	1848
Williams, W. H.	1871	53	Denver	March 15, 1893	University of Louisiana	1867
Keating, J. M.	1892	42	Colorado Springs	November 18, 1893	University of Pennsylvania	1873
Finfrock, J. H.	1885	....	Boise City, Idaho	February, 1894	Medical College of Ohio	1863
Tucker, B. St. George	1880	55	Colorado Springs	March 30, 1894	University City of New York	1860
Reed, Charles M.	1894	24	Dotsero, Colo.	September 29, 1894	University of Louisville	1892
Scully, D. J.	1893	33	Lindsay, Ontario	April 21, 1895	McGill University	1887
Powers, J. W.	1892	37	Salt Lake City	March 25, 1895	Rush Medical College	1885
Jenner, C. W.	1891	55	Denver	August 11, 1895	Western Reserve Medical College	1882
Adams, B. F. D.	1888	....	Colorado Springs	October 28, 1895	Harvard Medical School	1862
D'Avignon, F. F.	1880	49	Leadville	November 6, 1895	McGill University	1871
Rose, Edward P.	1892	40	Salt Lake City	November 6, 1895	South Carolina Medical College	1878
Manly, Chas. S.	1892	29	Denver	November 13, 1895	Medical Department Denver University	1891
Bosanko, S. Arthur	1885	39	Leadville	November 23, 1895	.....	.....
Fearing, Sarah J.	1895	38	Denver	January 11, 1896	Woman's Medical College, Philadelphia	1890
Cattanach, A. J.	1889	49	Denver	May 30, 1896	McGill University, Montreal	1871
Reed, Jacob, Jr.	1877	57	Colorado Springs	December 15, 1896	Jefferson College, Pennsylvania	1866
Morgan, Anna E.	1892	....	Denver	January 23, 1896	Medical Department Denver University	1892
Mager, Hugo	1895	46	Denver	July 18, 1897	Northwestern Medical College	1883
Crouch, H. C.	1892	40	Denver	April 20, 1898	University of Gœttingen	1890
Herrick, J. C.	1891	55	Denver	September 30, 1898	Yale and Long Island College Hospital	1865
Dawson, J. W.	1878	51	Canon City	January 8, 1899	Rush Medical College	1871
Kahn, Lee	1892	32	Leadville	February, 1899	Starling Medical College, Columbus, Ohio	1888

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